

STUDENT ID #: 41503028; GROUP #: 2

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

1. What happens when water molecules condense?  
a. Water molecules become larger  
☒ b. Gaseous water becomes liquid water  
c. Hydrogen and oxygen atoms combine to form liquid water  
d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir  
a. The atmosphere  
b. Oceans  
☒ c. Glaciers  
d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?  
☒ a. Rainfall and surface runoff into the lake  
b. Seasonal high water from the Mississippi River  
☐ c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.  
a. A= evaporation, B= deposition, C= sublimation  
☒ b. A = condensation, B= precipitation, C= evaporation  
c. A= sublimation, B= precipitation, C= evaporation  
d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?  
☒ a. Liquid water from the pot condenses  
b. Liquid water from the pot evaporates  
☐ c. Water vapor from the pot condenses  
☐ d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?  
☒ a. This is what one would predict with global warming  
☐ b. This is the opposite of what one would predict with global warming  
c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

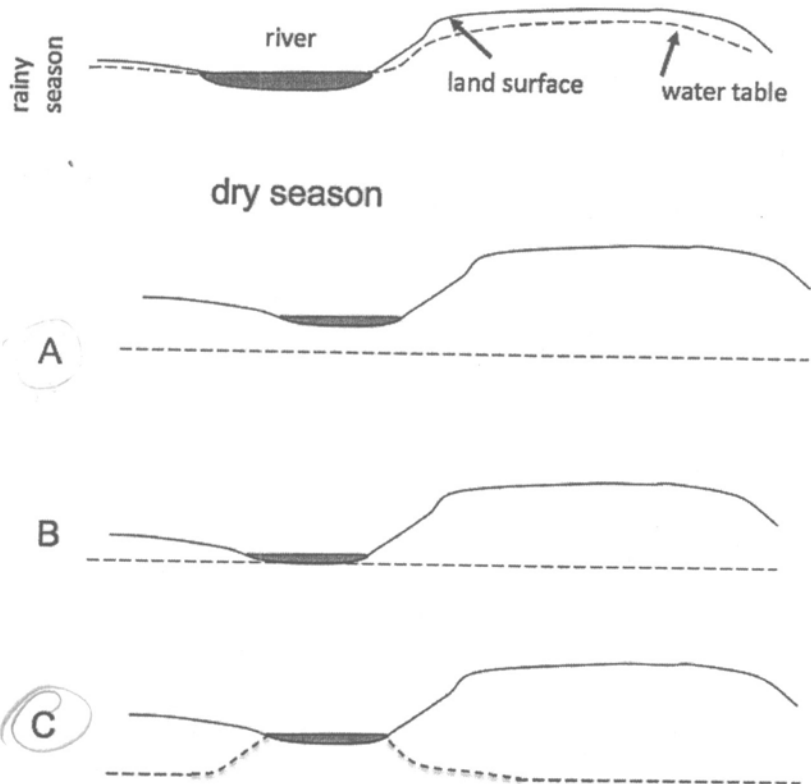
2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A = chemical, B = thermal, C = thermal  
b. A = gravitational, B = gravitational, C = thermal  
c. A = gravitational, B = thermal, C = thermal  
d. A = thermal, B = thermal, C = thermal



8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:

- a. been greater  
b. been less  
c. remained the same

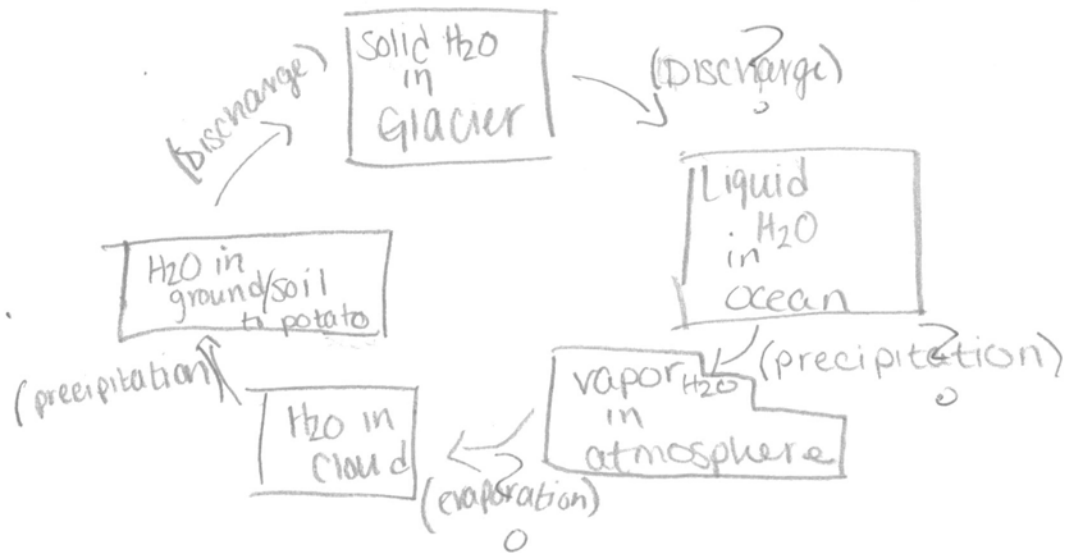
ice denser than H<sub>2</sub>O  
ice floats

10. What happens when plants respire?

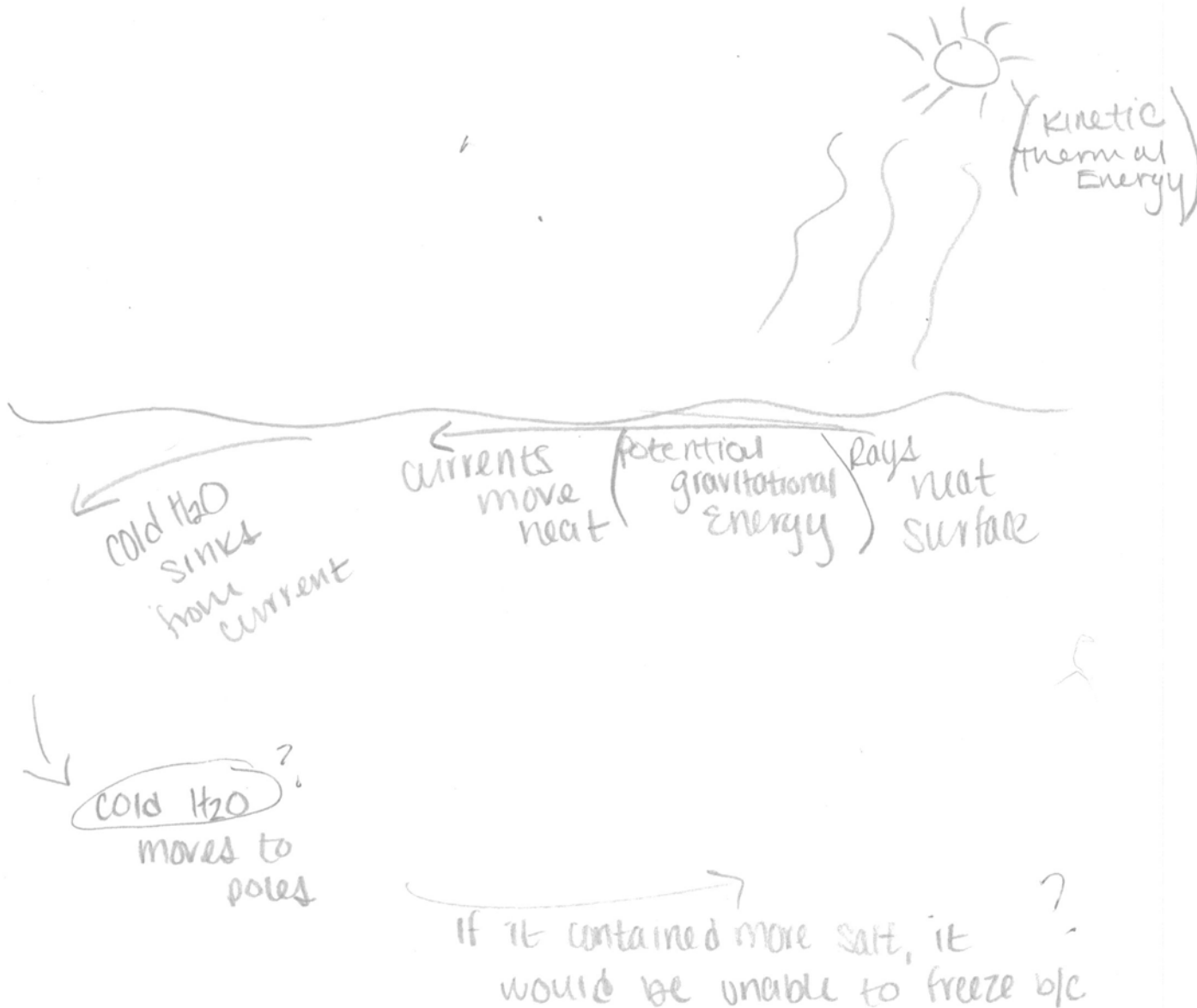
- a. Plants convert biomass into energy  
b. Plants convert energy into biomass  
c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
  - A name for each process that moves or transforms water



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
  - The energy that is causing movement or transformation of water.



EXTRA CREDIT (2 points)

2 EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

unable to change states.

YOUR SCORE:

65



STUDENT ID #: A39228160; GROUP #: E

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

8

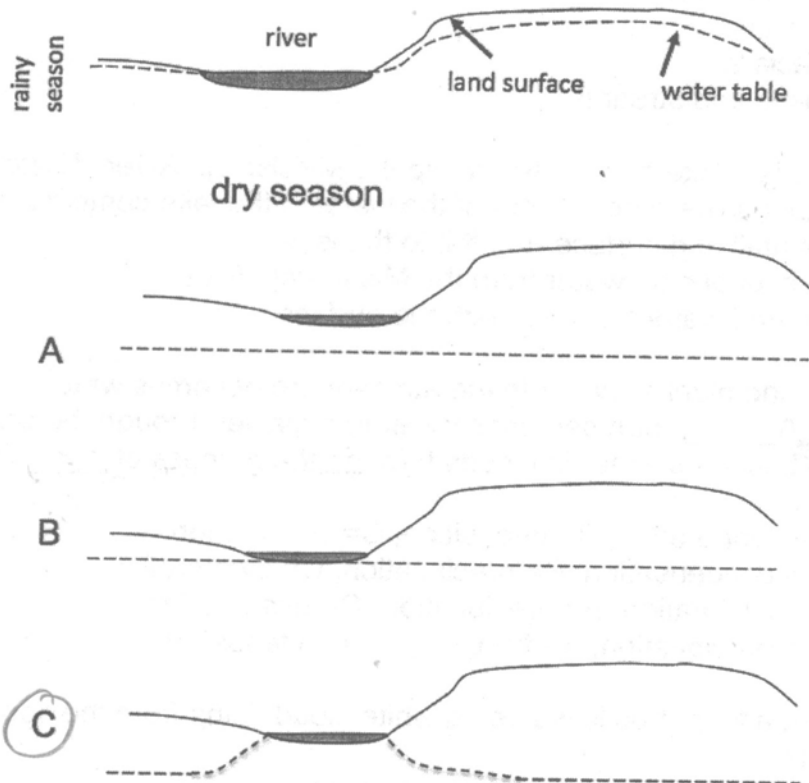
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  - a. Water molecules become larger
  - ☒ b. Gaseous water becomes liquid water
  - c. Hydrogen and oxygen atoms combine to form liquid water
  - d. The temperature of water molecules decreases
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  - a. The atmosphere
  - b. Oceans
  - ☒ c. Glaciers
  - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
  - ☒ a. Rainfall and surface runoff into the lake
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  - c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of   A  , then becomes water in a glacier through the process of   B  , and then becomes water in clouds through the process of   C  .
  - a. A= evaporation, B= deposition, C= sublimation
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7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A Grav energy. Water in the atmosphere becomes water in clouds as a result of Therm B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

infiltration  
condensation

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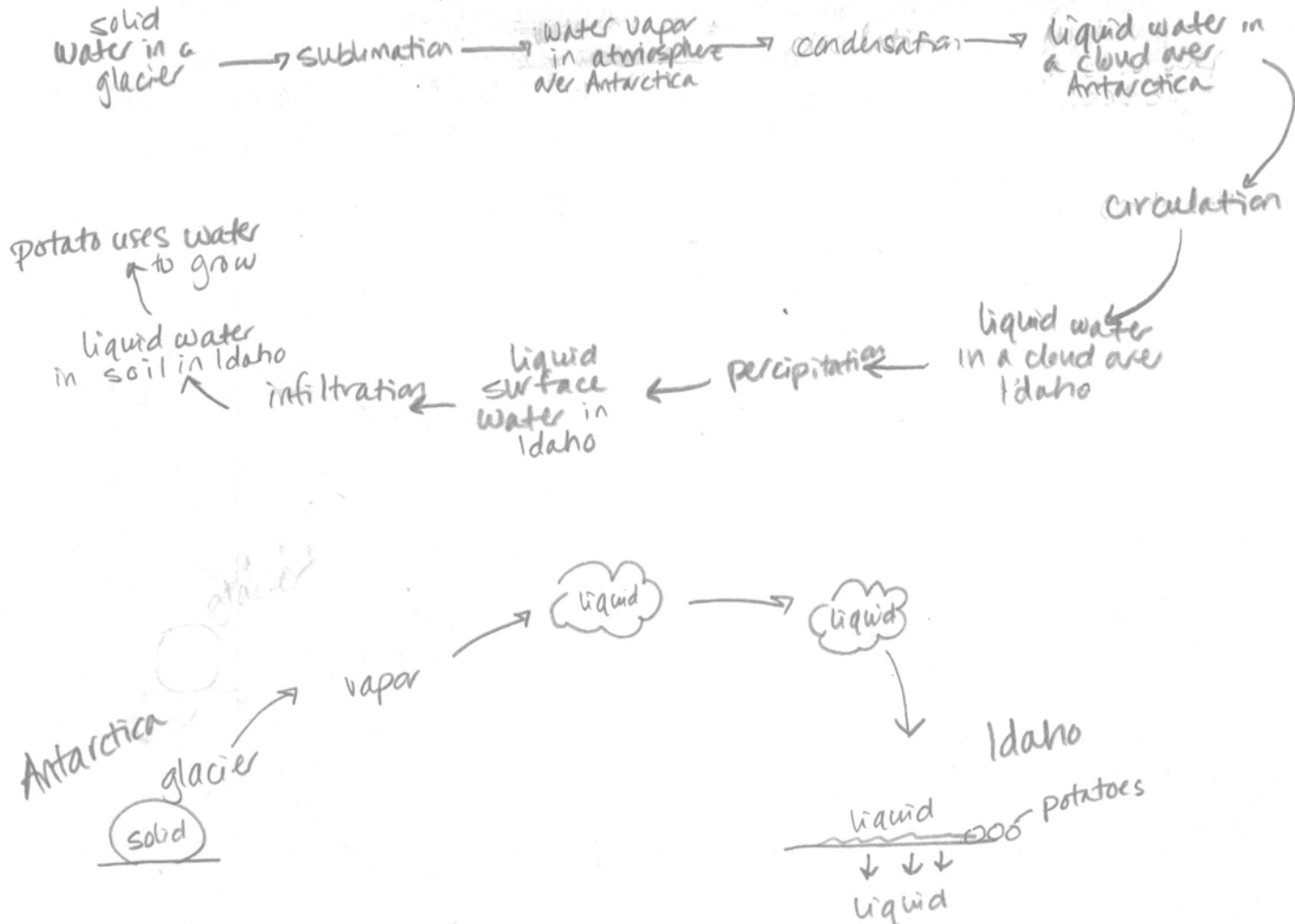


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater  
b. been less  
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy  
b. Plants convert energy into biomass  
c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

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25

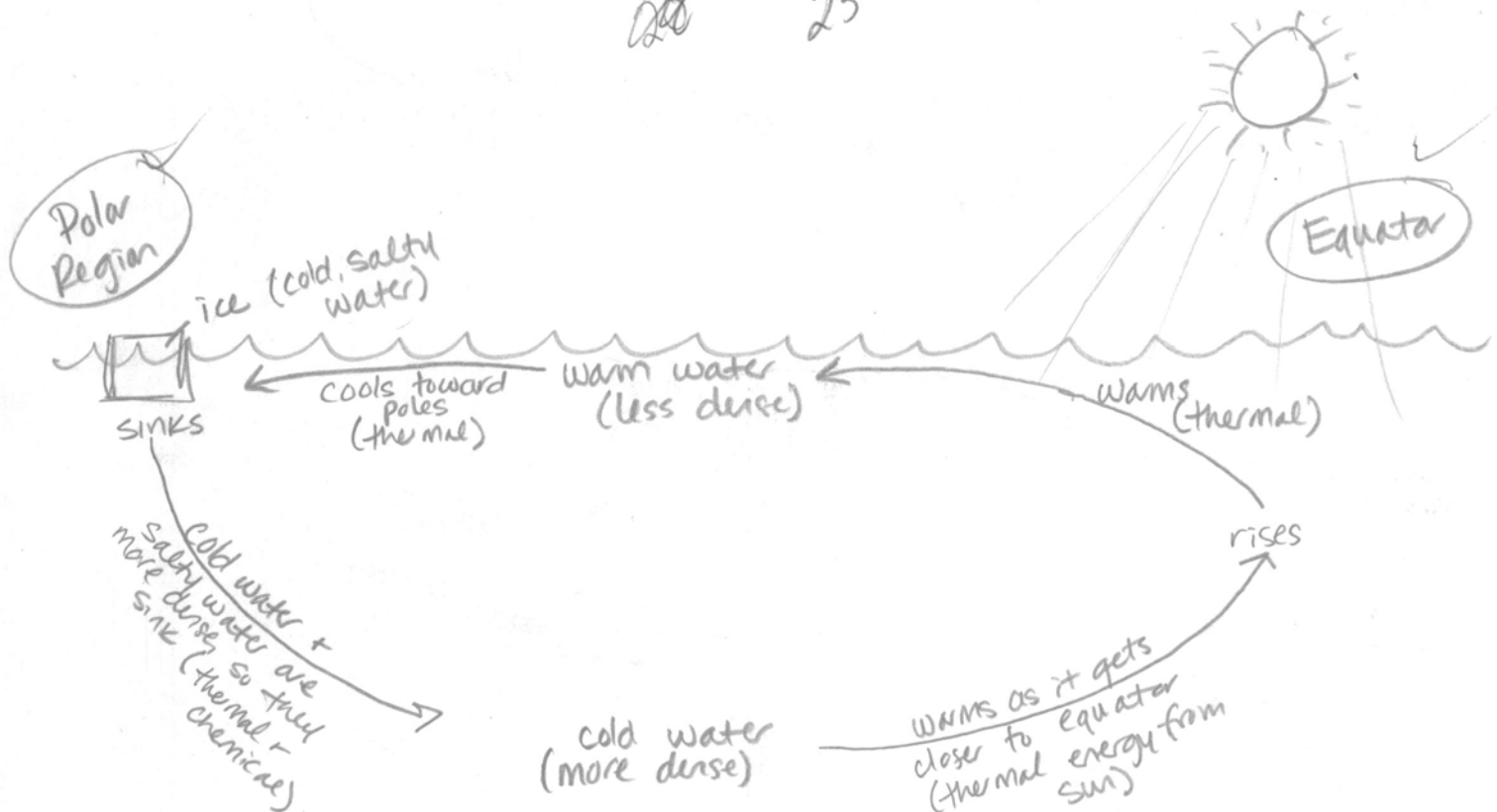
2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

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Salty ↓ fresh ↑

If the polar ice was saltier, it would be more dense. That means that the ice would sink faster and speed up the thermohaline circulation process, because if the water sinks faster, the whole process would have to speed up to maintain equilibrium.

25 °C



2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy – wood
- They both convert kinetic energy into potential energy.

YOUR SCORE:

92

STUDENT ID #: A42190700; GROUP #: e

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

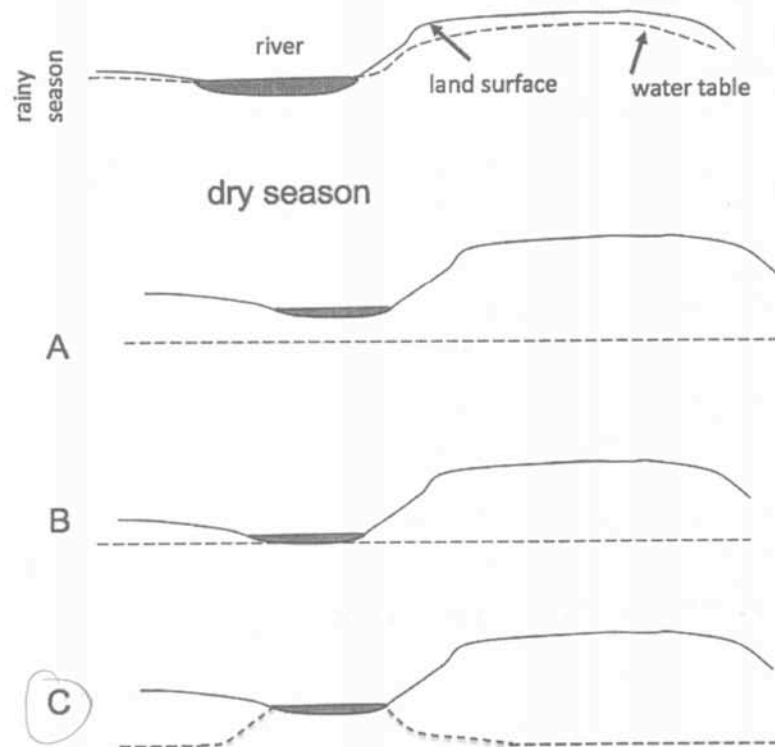
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  - a. The atmosphere
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3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from? ✓
  - a. Rainfall and surface runoff into the lake
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4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of gas → liquid A, then becomes water in a glacier through the process of liquid → solid B, and then becomes water in clouds through the process of solid → gas C.
  - a. A = evaporation, B = deposition, C = sublimation
  - b. A = condensation, B = precipitation, C = evaporation
  - c. A = sublimation, B = precipitation, C = evaporation
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ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

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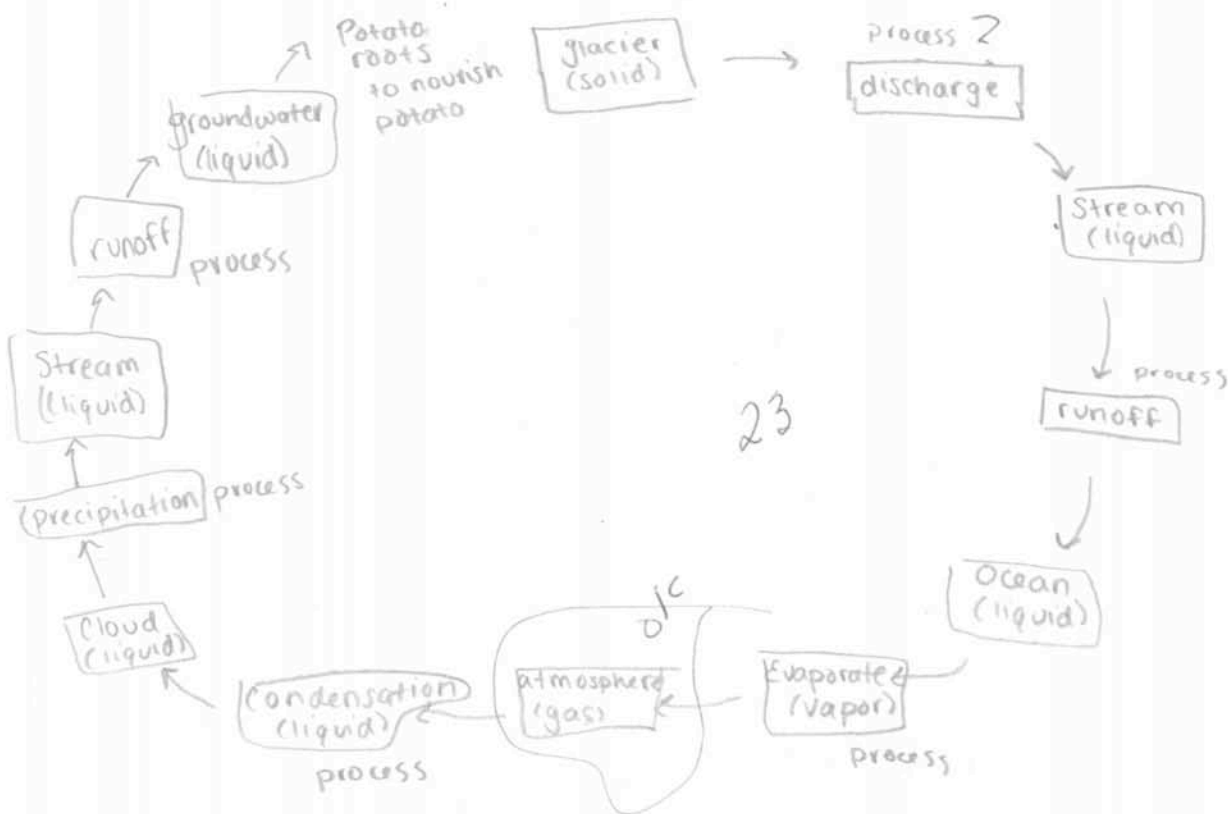
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- a. Plants convert biomass into energy
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**SHORT ANSWER. 25 points each (50 points total)**

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After the liquid penetrates the groundwater it reaches the potato roots where it is used for nourishment and energy.

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15 Thermohaline refers to the presence of salt and changing temperatures in a body of water. The amount of salt, or composition, and the temperature have a direct effect on density differences in water. If the water in ice had more salt it would have a direct effect on the thermohaline circulation. This circulation carries warm water from the equator to the poles and carries cool water down towards the equator. The amount of salt in the ice could change <sup>how?</sup> the density of the water surrounding it. This would disrupt the time it would take for the water to travel down to the equator, maybe decreasing it.

The energy causing density differences deals with solar energy. An increased temperature leads to a decrease in density. This, along with change in composition drive the circulation of water.



2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
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YOUR SCORE:

85



ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: 1412766836; GROUP #: F

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

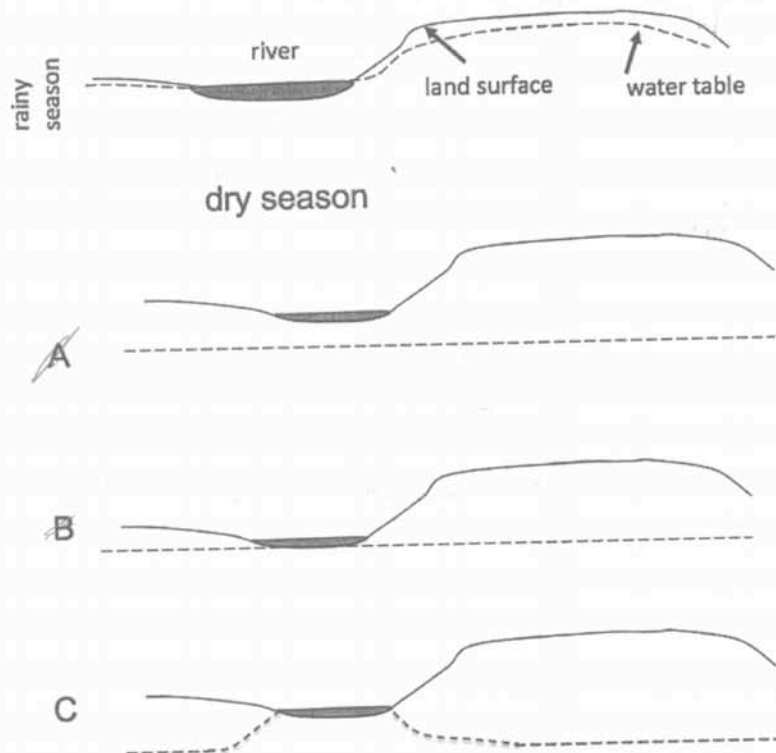
- 9
1. What happens when water molecules condense?  
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  4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of Condensation A \_\_\_\_\_, then becomes water in a glacier through the process of \_\_\_\_\_ B precip, and then becomes water in clouds through the process of \_\_\_\_\_ C evapor.  
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☐ b. A = condensation, B = precipitation, C = evaporation  
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ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of grav. A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of ther. B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of thermal C \_\_\_\_\_ energy.

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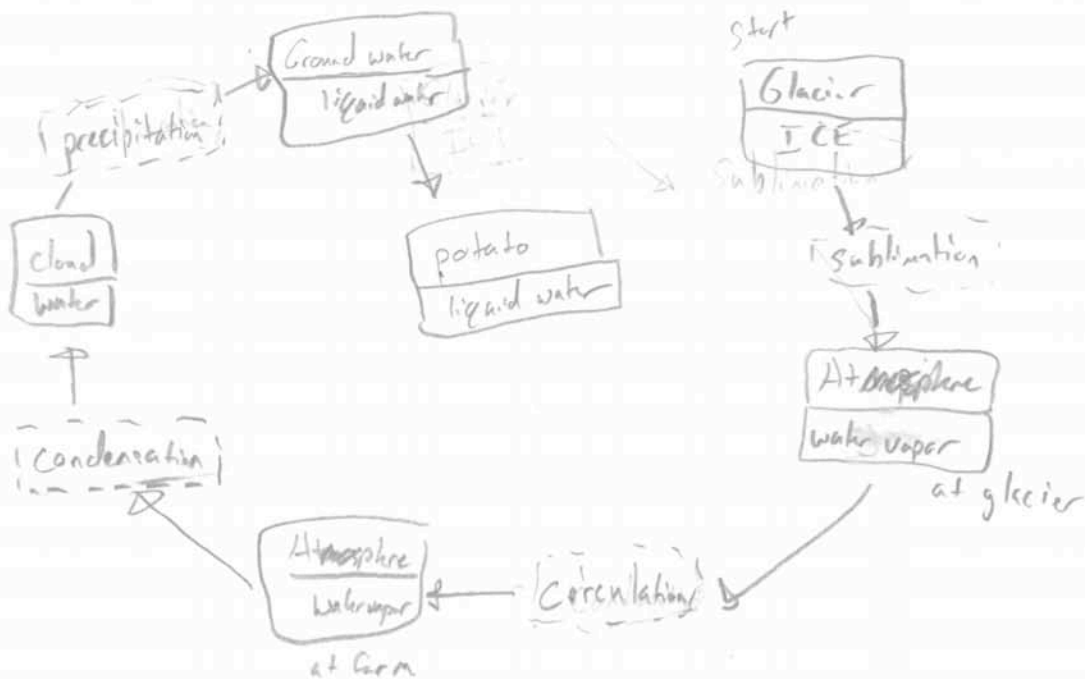
0.9 g/cc      1.0 g/cc

10. What happens when plants respire?

- a. Plants convert biomass into energy
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SHORT ANSWER. 25 points each (50 points total)

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25

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a) Surface Air is heated at the equator and raises into the atmosphere. It travels to the poles to cool off and then returns to the surface as cool air. The cool air then travels to the equator to heat up again.



b) Thermal energy from the sun is causing the movement of gasses in the atmosphere.

The thermohaline circulation would not change because it involves the circulation of air and water vapor not seawater.

What is?

⊞

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
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YOUR SCORE:

74

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A43864729; GROUP #: F

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

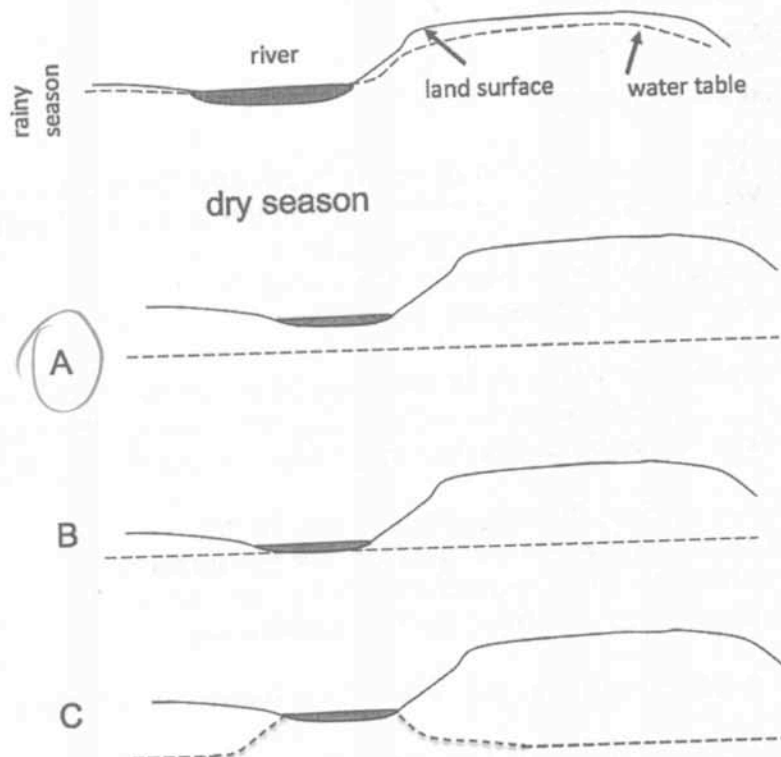
- 4
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ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

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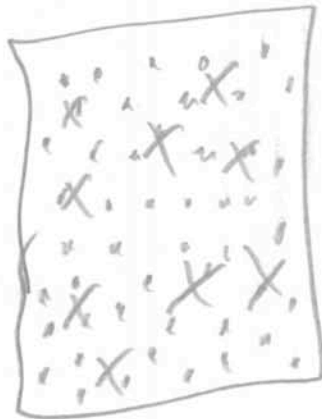
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This all can be made possible by the water cycle. The water from the glacier can <sup>subl.</sup> evaporate into the atmosphere and condensation would bring that to the clouds. Precipitation can make that drop down to a potatoe farm where the water nourishes a potatoe plant and becomes a part of the vely potatoe you're eating.

15

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
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if the polar ice contained more salt than the surrounding seawater from which it freezes the thermohaline circulation would be slowed down because the salt content would be greater and the molecules would no longer have as much room to move around as they do in fresh water



2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- ☒ They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

YOUR SCORE:

37



ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A423 85484; GROUP #: F

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

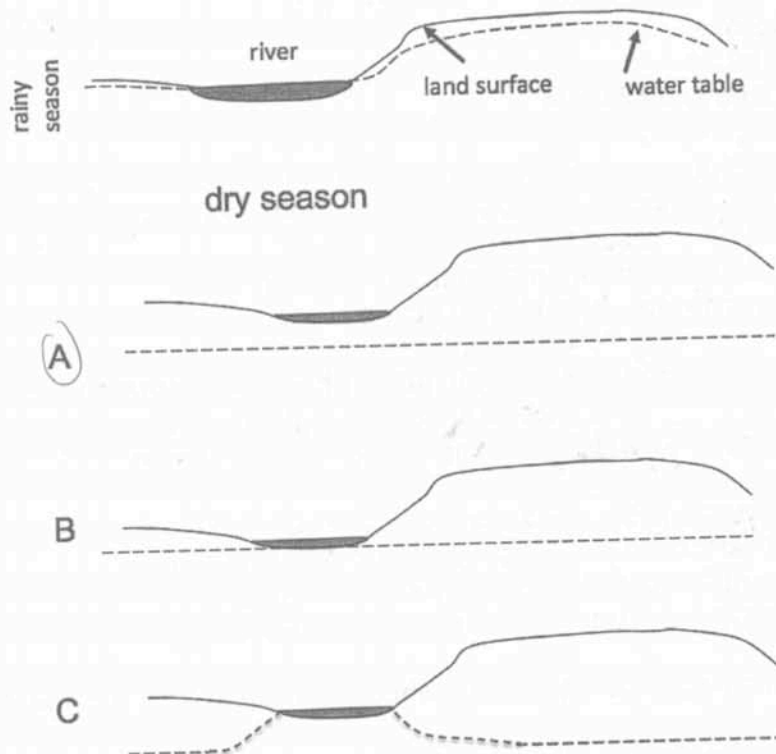
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    - c. Water vapor from the pot condenses
    - d. Water vapor from the pot evaporates
  6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
    - ☒ a. This is what one would predict with global warming
    - b. This is the opposite of what one would predict with global warming
    - c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal  
b. A = gravitational, B= gravitational, C= thermal  
☒ c. A = gravitational, B= thermal, C= thermal  
d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

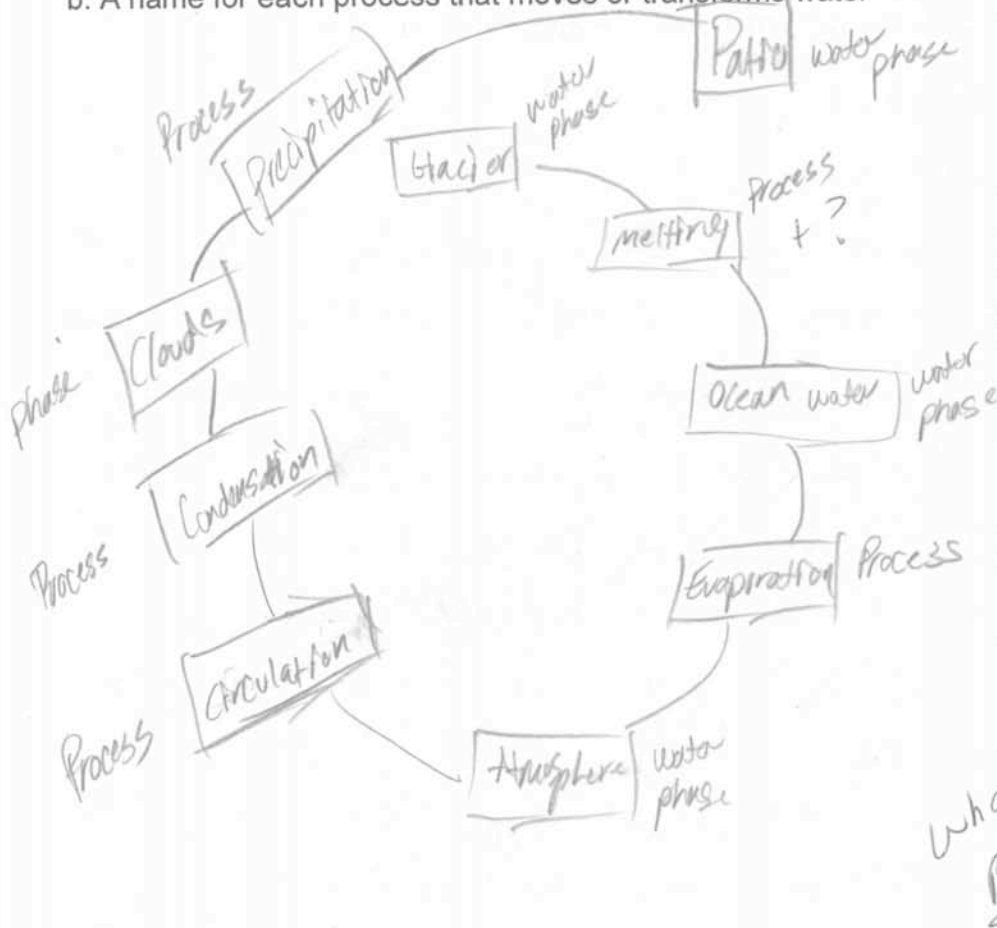


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- ☒ a. been greater  
b. been less  
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy  
b. Plants convert energy into biomass  
☒ c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

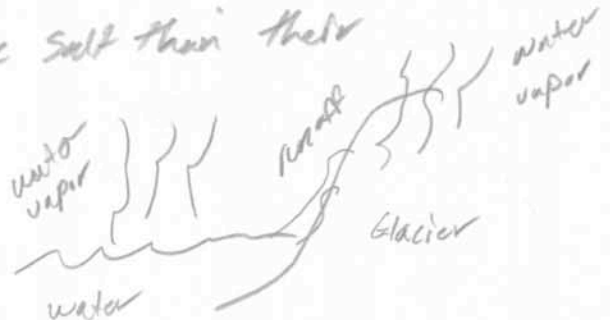
- Water phase at each step in the journey
- A name for each process that moves or transforms water



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

2  
the thermohaline circulation is the Earth's natural way to create fresh water. The thermohaline circulation essentially separates the salt from the water. If the polar ice contained more salt than the surrounding seawater, the circulation would not change. Thermal energy would cause the water from the ice to evaporate into the atmosphere while the salt would run off into the ocean. If the ice would melt into the ocean, gravitational energy would pull the melting ice into the ocean. Then thermal energy would cause the water to evaporate & the salt to remain in the water. Overall, the circulation would be altered, but the circulation process would have no change if the ice caps had more salt than their surrounding waters.



- 2 EXTRA CREDIT (2 points)  
EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

40 22

YOUR SCORE:

62

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A41450320; GROUP #: F

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

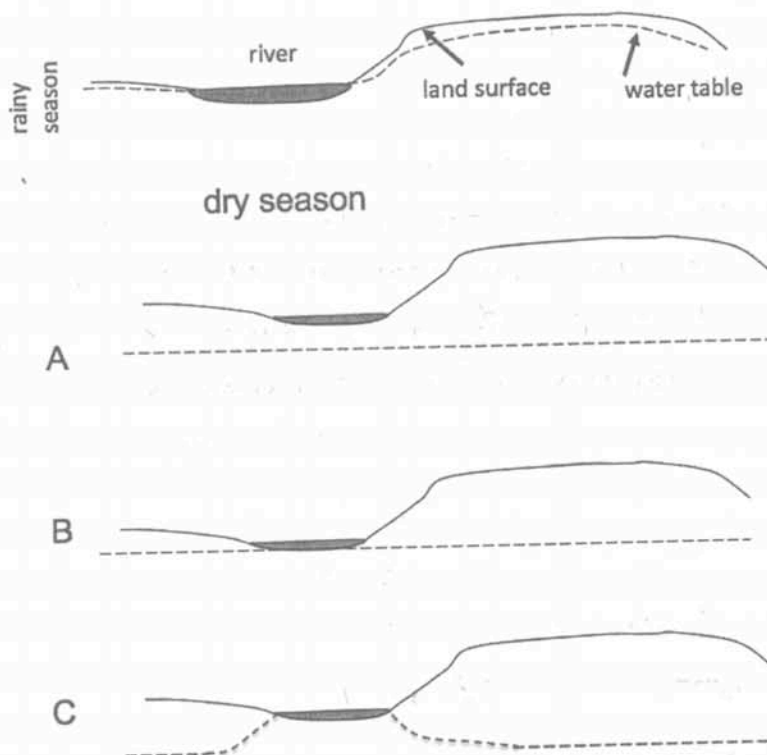
- 8
1. What happens when water molecules condense?
    - a. Water molecules become larger
    - b. Gaseous water becomes liquid water
    - c. Hydrogen and oxygen atoms combine to form liquid water
    - d. The temperature of water molecules decreases
  2. Which of the following is the largest freshwater reservoir
    - a. The atmosphere
    - b. Oceans
    - c. Glaciers
    - d. Lakes and streams
  3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
    - a. Rainfall and surface runoff into the lake
    - b. Seasonal high water from the Mississippi River
    - c. Ground water from beneath the surface
  4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of \_\_\_\_A\_\_\_\_, then becomes water in a glacier through the process of \_\_\_\_B\_\_\_\_, and then becomes water in clouds through the process of \_\_\_\_C\_\_\_\_.
    - a. A= evaporation, B= deposition, C= sublimation
    - b. A = condensation, B= precipitation, C= evaporation
    - c. A= sublimation, B= precipitation, C= evaporation
    - d. A = precipitation, B= freezing, C= condensation
  5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
    - a. Liquid water from the pot condenses
    - b. Liquid water from the pot evaporates
    - c. Water vapor from the pot condenses
    - d. Water vapor from the pot evaporates
  6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
    - a. This is what one would predict with global warming
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ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



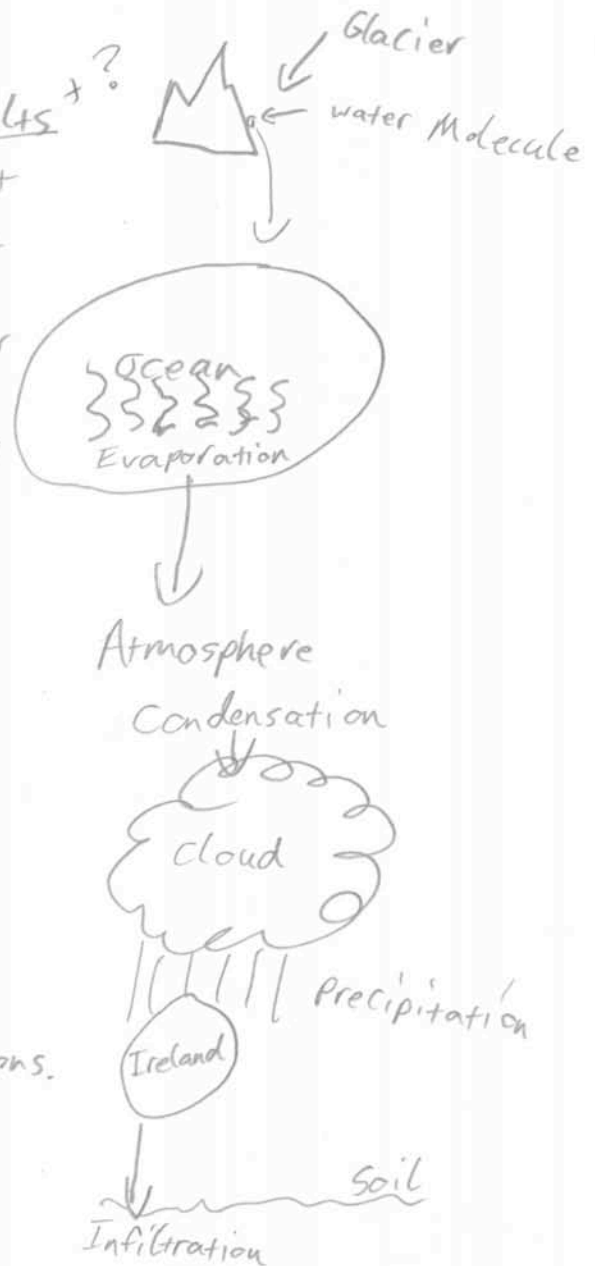
9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
  - b. been less
  - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
  - b. Plants convert energy into biomass
  - c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- a. Water phase at each step in the journey
  - b. A name for each process that moves or transforms water

The water molecule melts <sup>?</sup> and joins the ocean. It then evaporates, and is in the atmosphere. It then condenses and forms with other molecules to make a cloud. This cloud then floats over Ireland and the molecules gain so much mass they fall in precipitation. Once on the surface the molecule enters the soil of a potato field by infiltration. The roots of a potato then suck the water into it and use it for various functions.

23

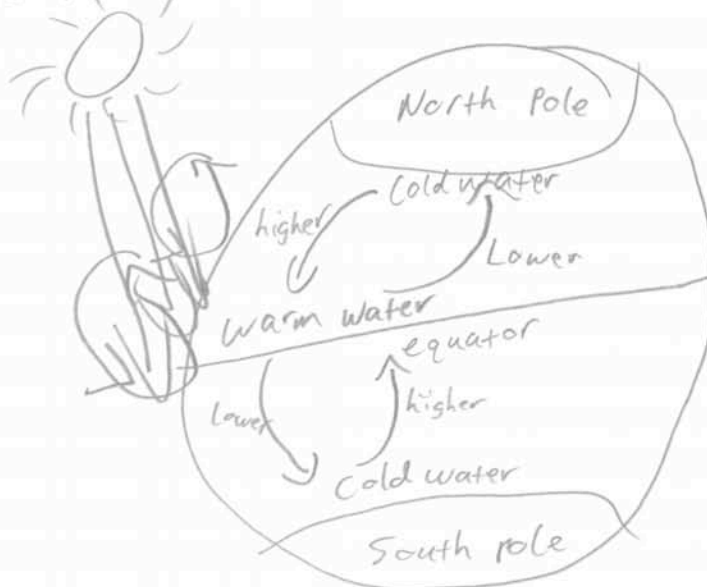


2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
  - The energy that is causing movement or transformation of water.

The thermohaline process begins with the sun it heats the air and water around the equator the most. Water at the equator is salt water. It is then sucked to the poles because at the poles the water is colder. ~~then~~ It then freezes with less salt in it leaving more salt in the surrounding water this then is sucked back to the equator by gravitational energy.

2 [ If there were more salt in the ice then we would not have this process

15



2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

YOUR SCORE:

80



ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A40737921; GROUP #: 6

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

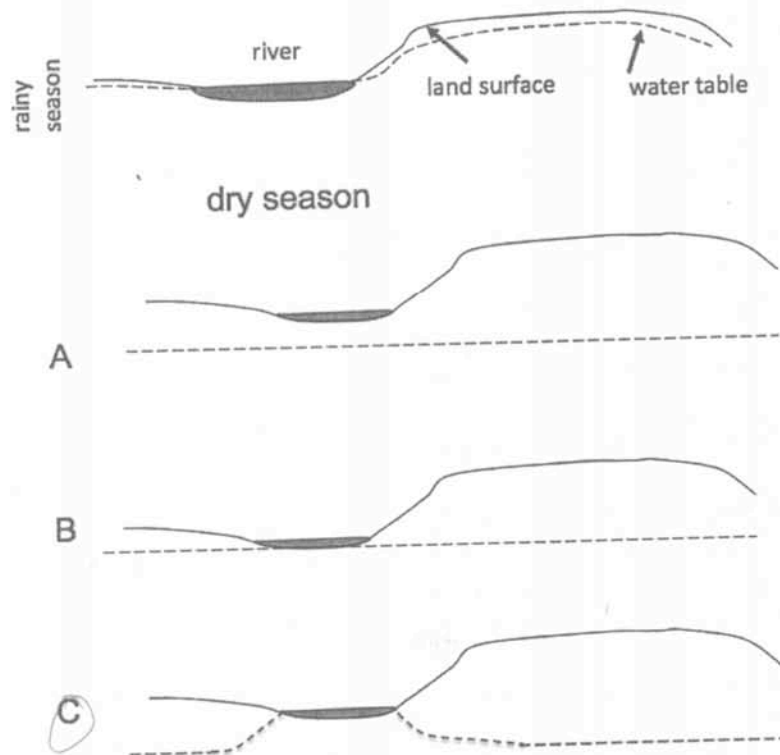
1. What happens when water molecules condense? 9
  - a. Water molecules become larger
  - ☒ b. Gaseous water becomes liquid water
  - c. Hydrogen and oxygen atoms combine to form liquid water
  - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
  - a. The atmosphere
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  - ☒ c. Glaciers
  - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
  - a. Rainfall and surface runoff into the lake
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  - ☒ c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
  - a. A= evaporation, B= deposition, C= sublimation
  - ☒ b. A = condensation, B= precipitation, C= evaporation
  - c. A= sublimation, B= precipitation, C= evaporation
  - d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
  - a. Liquid water from the pot condenses
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6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
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ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
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8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

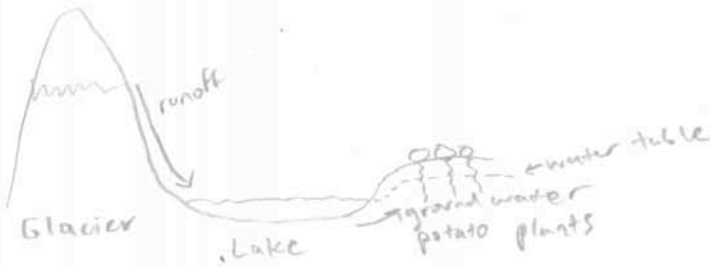


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
  - b. been less
  - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
  - b. Plants convert energy into biomass
  - c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
  - A name for each process that moves or transforms water

PHASE



ice → The water molecule could start in a glacier, and through the process of runoff caused by gravity, the water molecule could travel to a nearby lake or other water reservoir. If the potato farm is near the lake, the water molecule could travel through the groundwater through infiltration, and be sucked up by the potato plant through uptake.

incomplete

20

2. When ice forms from seawater, the ice contains less salt than the remaining water. **Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes.** You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
  - b. The energy that is causing movement or transformation of water.

If the ice formed in seawater contained more salt than the surrounding sea water, the ice would be much more dense. The ice could possibly become denser than the water, causing it to sink deeper into the cooler, saltier water. This would ensure that the water near the surface is warmer, with no ice cooling it down. More of the water near the surface would then be evaporated, causing an increase of water in the atmosphere and also leaving behind more of the dissolved ions, creating and even more concentrated saline water.

2 EXTRA CREDIT (2 points)

- EC. How are burning wood and respiration similar?
- a. They both destroy matter during energy conversion
  - b. They both convert thermal energy into gravitational energy
  - c. They both convert chemical energy into thermal energy
  - d. They both convert kinetic energy into potential energy.

YOUR SCORE:

77

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A42235241; GROUP #: G

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

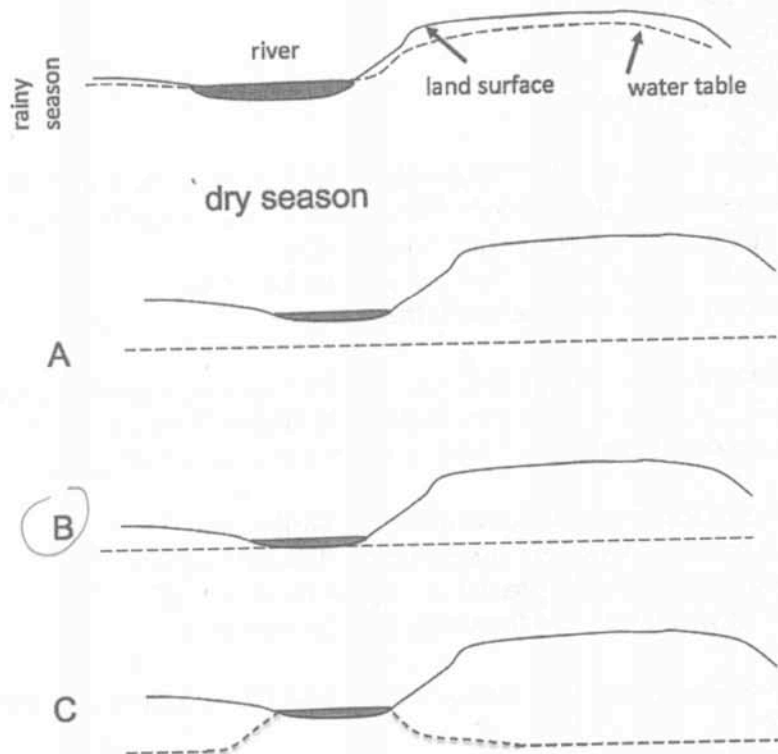
1. What happens when water molecules condense? 8
  - a. Water molecules become larger
  - ☒ b. Gaseous water becomes liquid water
  - c. Hydrogen and oxygen atoms combine to form liquid water
  - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
  - a. The atmosphere
  - b. Oceans
  - ☒ c. Glaciers
  - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
  - a. Rainfall and surface runoff into the lake
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  - ☒ c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of \_\_\_\_A\_\_\_\_, then becomes water in a glacier through the process of \_\_\_\_B\_\_\_\_, and then becomes water in clouds through the process of \_\_\_\_C\_\_\_\_.
  - a. A= evaporation, B= deposition, C= sublimation
  - ☒ b. A = condensation, B= precipitation, C= evaporation
  - c. A= sublimation, B= precipitation, C= evaporation
  - d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
  - a. Liquid water from the pot condenses
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6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
  - ☒ a. This is what one would predict with global warming
  - b. This is the opposite of what one would predict with global warming
  - c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal  
b. A = gravitational, B= gravitational, C= thermal  
c. A = gravitational, B= thermal, C= thermal  
d. A= thermal, B= thermal, C= thermal

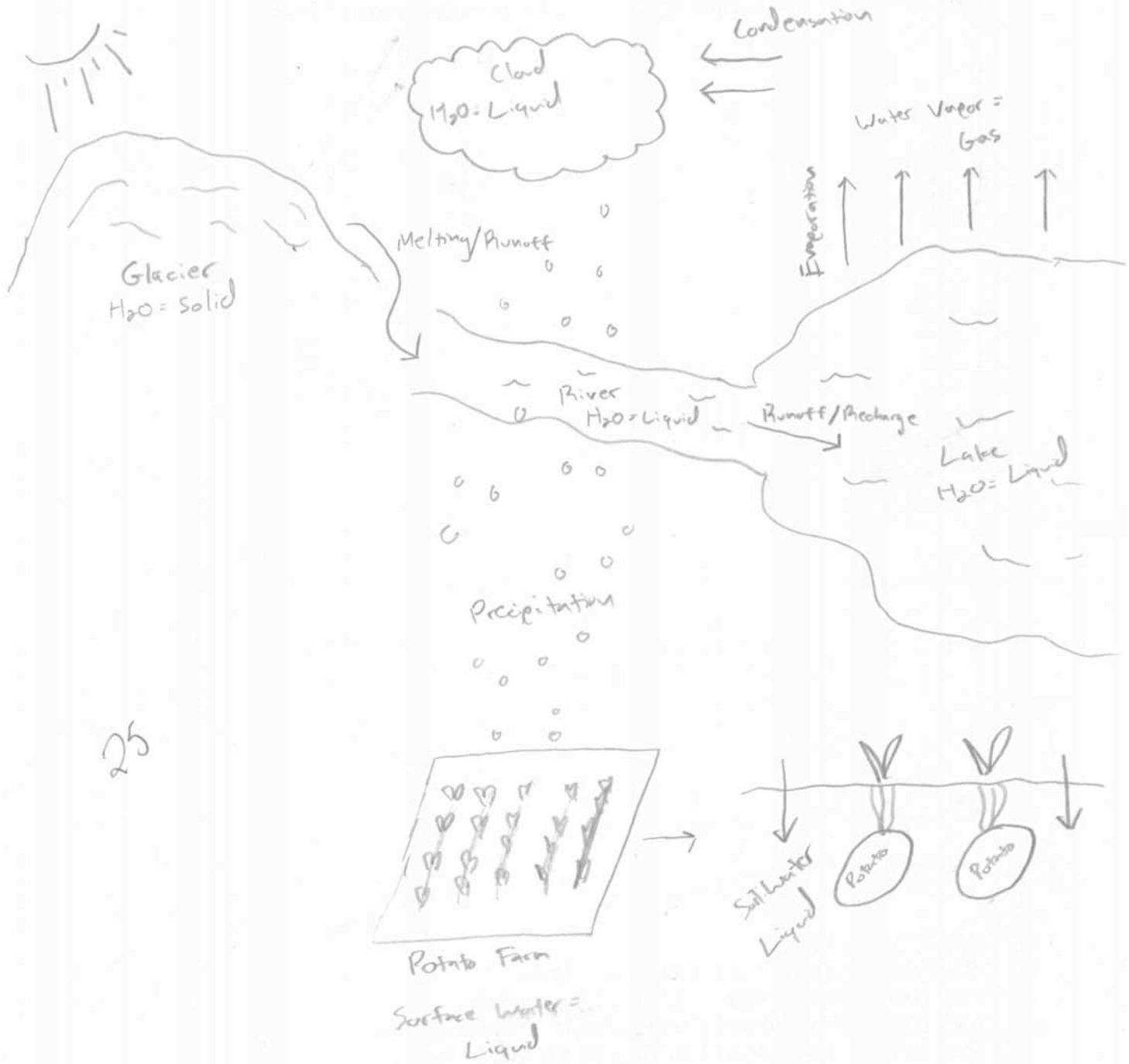
8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



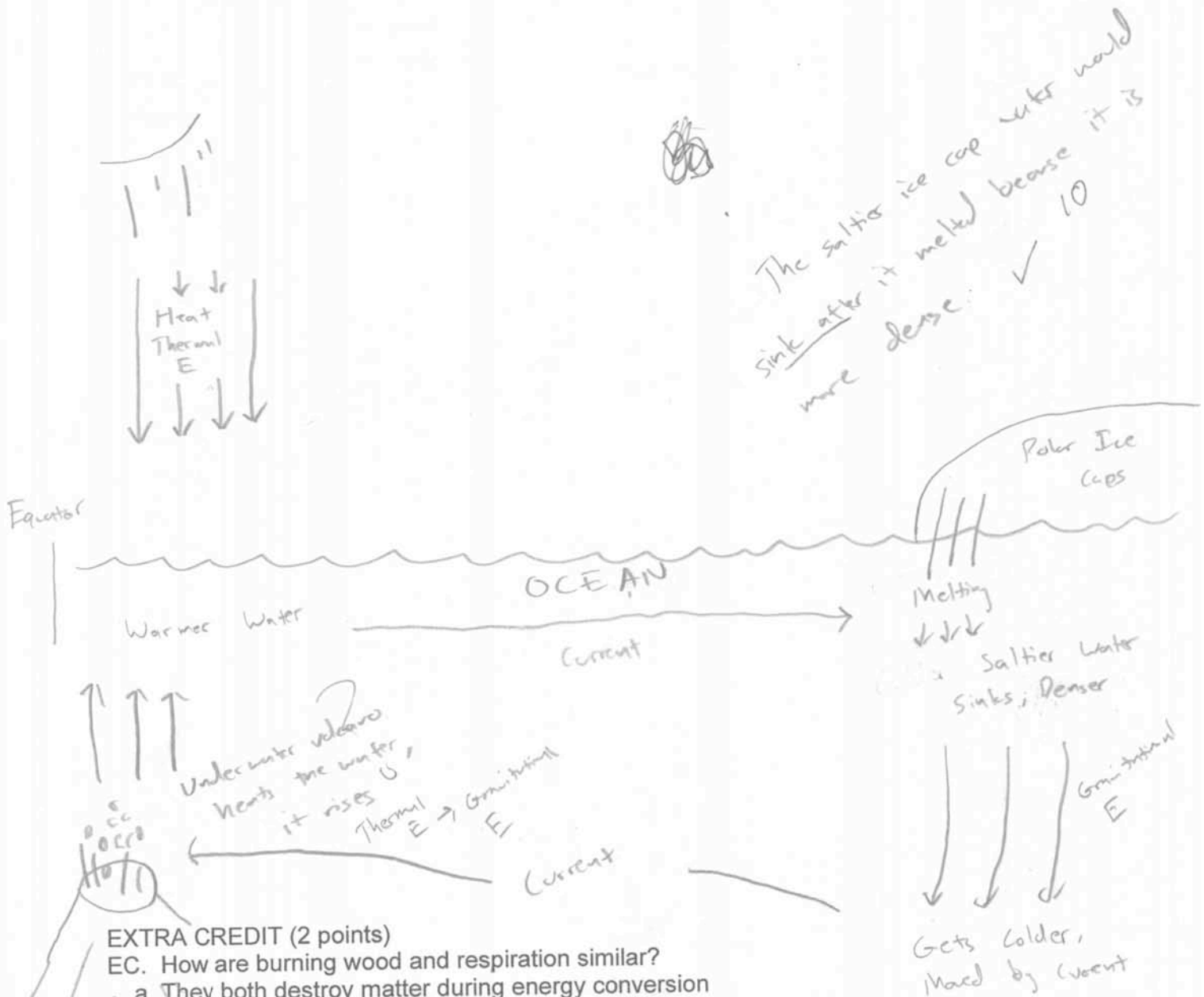
9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater  
b. been less  
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy  
b. Plants convert energy into biomass  
c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- a. Water phase at each step in the journey
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2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
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EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

YOUR SCORE:

77



STUDENT ID #: A40659708; GROUP #: G

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?

- a. Water molecules become larger ~~X~~
- ☒ b. Gaseous water becomes liquid water
- c. Hydrogen and oxygen atoms combine to form liquid water ~~X~~
- d. The temperature of water molecules decreases ~~X~~



9

2. Which of the following is the largest freshwater reservoir

- a. The atmosphere
- b. Oceans ~~X~~
- ☒ c. Glaciers
- d. Lakes and streams

3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?

- a. Rainfall and surface runoff into the lake
- b. Seasonal high water from the Mississippi River
- ☒ c. Ground water from beneath the surface

4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.

- a. A= evaporation, B= deposition, C= sublimation ~~X~~
- ☒ b. A = condensation, B= precipitation, C= evaporation
- c. A= sublimation, B= precipitation, C= evaporation ~~X~~
- d. A = precipitation, B= freezing, C= condensation ~~X~~

can - pre - evap

5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?

- a. Liquid water from the pot condenses
- b. Liquid water from the pot evaporates
- ☒ c. Water vapor from the pot condenses
- d. Water vapor from the pot evaporates

water vapor from the pot  
cooling & condensing again  
to form liquid water (visible)

6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?

- ☒ a. This is what one would predict with global warming
- b. This is the opposite of what one would predict with global warming
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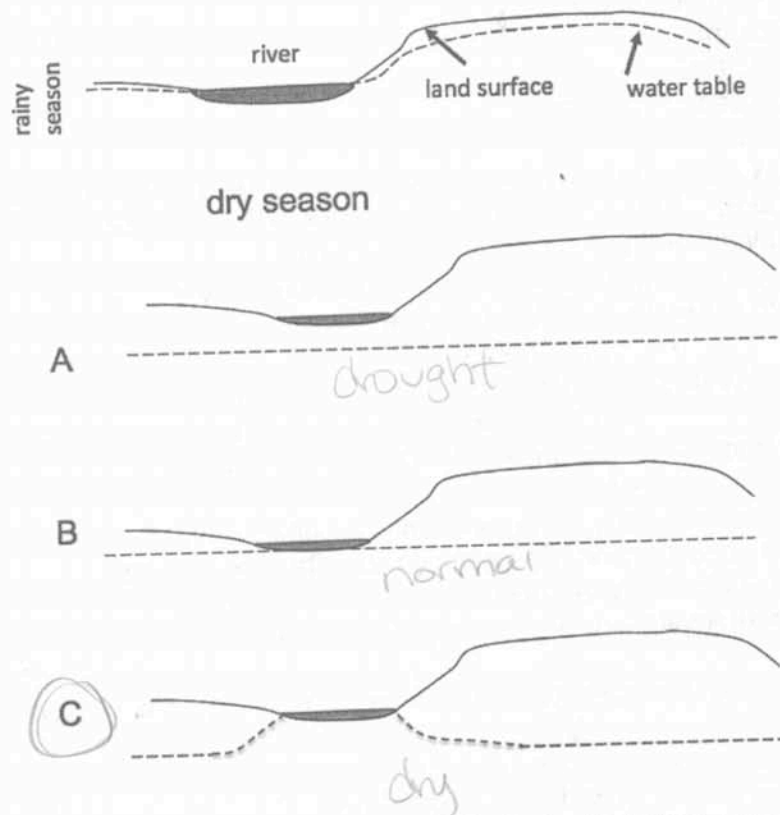
ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

grav - chem/ther - therm/chem

- a. A = chemical, B = thermal, C = thermal ☒  
b. A = gravitational, B = gravitational, C = thermal ☒  
c. A = gravitational, B = thermal, C = thermal ☒  
d. A = thermal, B = thermal, C = thermal ☒

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

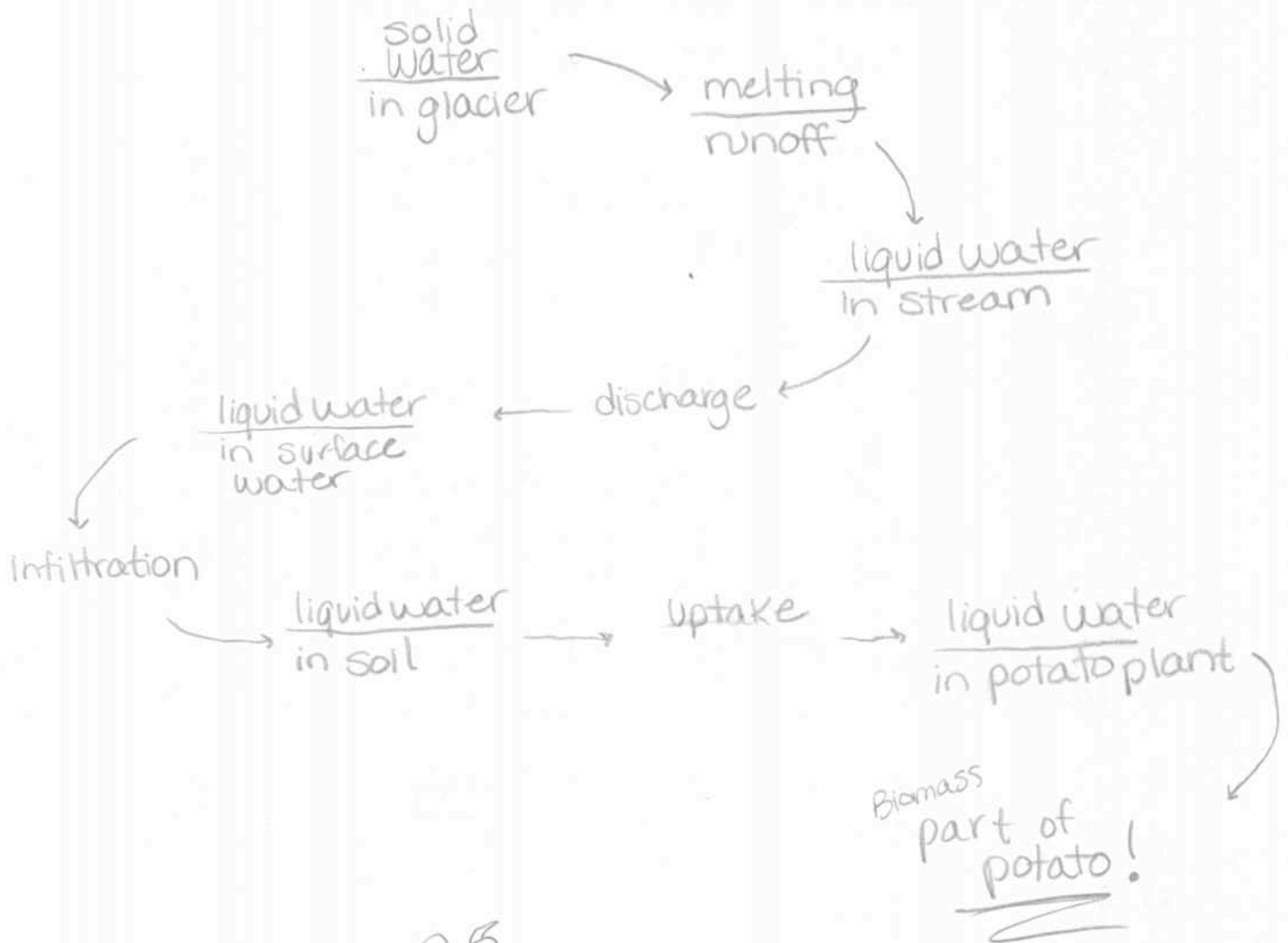


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater ☒  
b. been less  
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy  
b. Plants convert energy into biomass ☒  
c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
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25

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
  - The energy that is causing movement or transformation of water.

If polar ice contained more salt than surrounding sea water:

- Ice would have higher salinity (more salt)
- ice would be more dense than surrounding water.
- ice would sink to deeper depths of ocean where it is cold + more salinity concentration.
- Thermohaline circulation would slow because the polar waters would be colder and have more salinity, making it harder for warm water to circulate from the equatorial regions to the cold & sending the cold to the equatorial to be heated.

The energy that is causing movement or transformation of water is salinity & density (temp.)

25

It would take longer to heat / the polar regions would not get as warm as they normally would.

EXTRA CREDIT (2 points)

2 EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy ~~X~~
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy ~~X~~

cannot create or destroy matter

YOUR SCORE:

97

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: 641398940; GROUP #: 6

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?

10

- ☐ a. Water molecules become larger
- ☐ b. Gaseous water becomes liquid water
- ☒ c. Hydrogen and oxygen atoms combine to form liquid water
- ☐ d. The temperature of water molecules decreases

2. Which of the following is the largest freshwater reservoir

- ☐ a. The atmosphere
- ☐ b. Oceans
- ☒ c. Glaciers
- ☐ d. Lakes and streams

3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?

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- ☐ a. A= evaporation, B= deposition, C= sublimation
- ☒ b. A = condensation, B= precipitation, C= evaporation
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- ☐ d. A = precipitation, B= freezing, C= condensation

5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?

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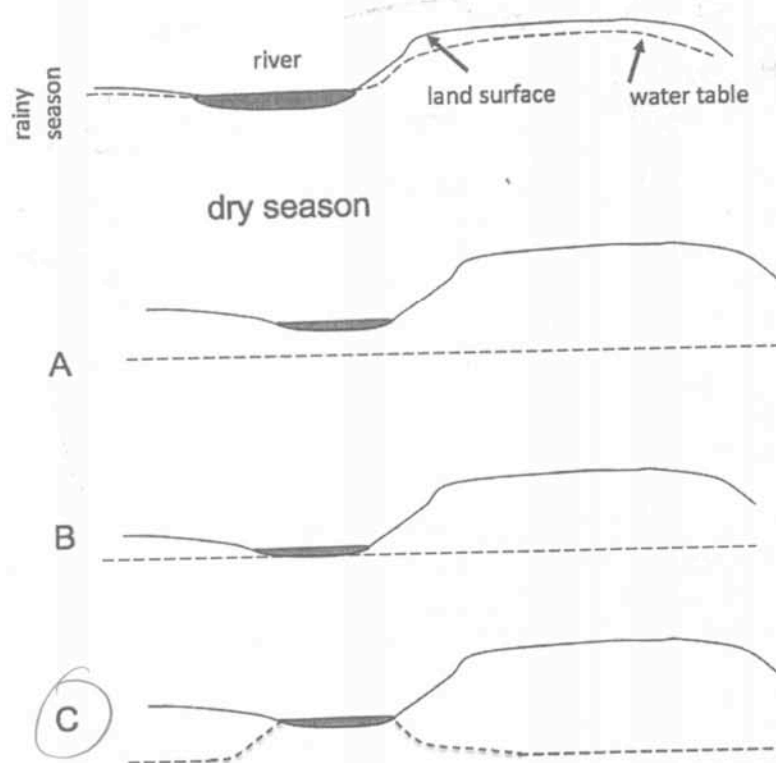
- ☒ a. This is what one would predict with global warming
- ☐ b. This is the opposite of what one would predict with global warming
- ☐ c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- ☒ c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
  - ☒ b. been less
  - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
  - b. Plants convert energy into biomass
  - ☒ c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
  - A name for each process that moves or transforms water



23

*[Handwritten signature]*

## EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
  - The energy that is causing movement or transformation of water.

If ice contained more salt, the oceans would be less salty.  
 In the ocean density is a factor of how the ocean circulates.  
 When ocean water is less salty it becomes less dense, pushing  
 Because hot water is less dense and  
 Fresh water is less dense than salt water, the circulation cycle  
 will be more prone to heat making the circulation run faster.  
 The energy cycling the ocean would be transferred  
 into thermal kinetic energy.  
 a larger amount of

5

2

## EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

YOUR SCORE:

80



ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A39995552; GROUP #: H

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?

- a. Water molecules become larger
- b. Gaseous water becomes liquid water
- c. Hydrogen and oxygen atoms combine to form liquid water
- d. The temperature of water molecules decreases

2. Which of the following is the largest freshwater reservoir

- a. The atmosphere
- b. Oceans
- c. Glaciers
- d. Lakes and streams

3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?

- a. Rainfall and surface runoff into the lake
- b. Seasonal high water from the Mississippi River
- c. Ground water from beneath the surface

4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.

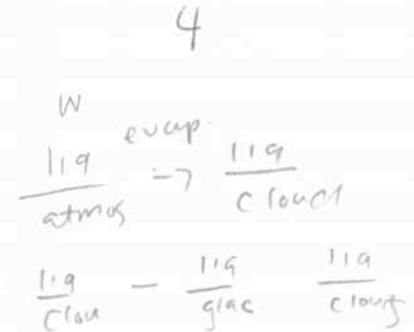
- a. A= evaporation, B= deposition, C= sublimation
- b. A = condensation, B= precipitation, C= evaporation
- c. A= sublimation, B= precipitation, C= evaporation
- d. A = precipitation, B= freezing, C= condensation

5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?

- a. Liquid water from the pot condenses
- b. Liquid water from the pot evaporates
- c. Water vapor from the pot condenses
- d. Water vapor from the pot evaporates

6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?

- a. This is what one would predict with global warming
- b. This is the opposite of what one would predict with global warming
- c. Predictions about global warming do not address global precipitation.

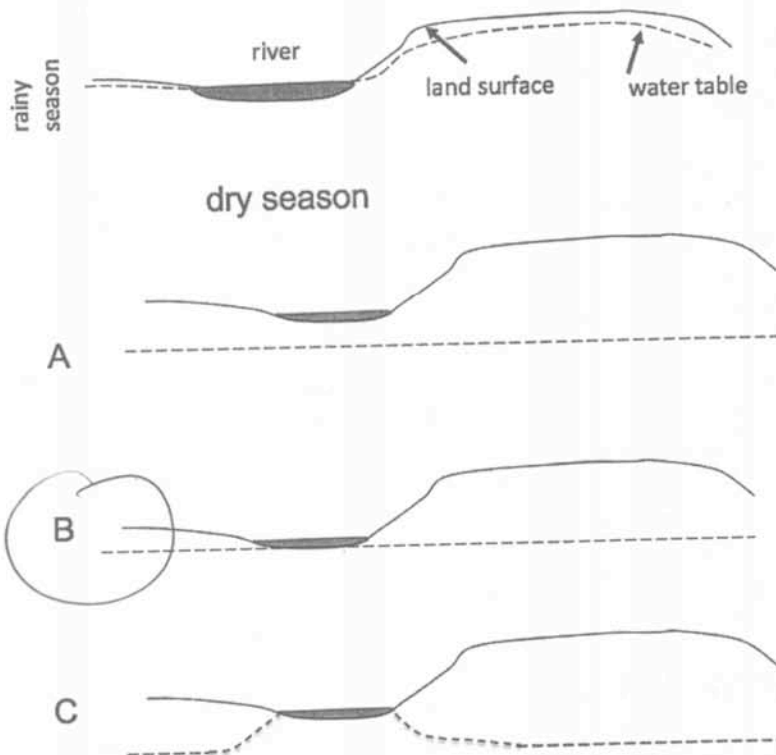


ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal  
b. A = gravitational, B= gravitational, C= thermal  
c. A = gravitational, B= thermal, C= thermal  
d. A= thermal, B= thermal, C= thermal

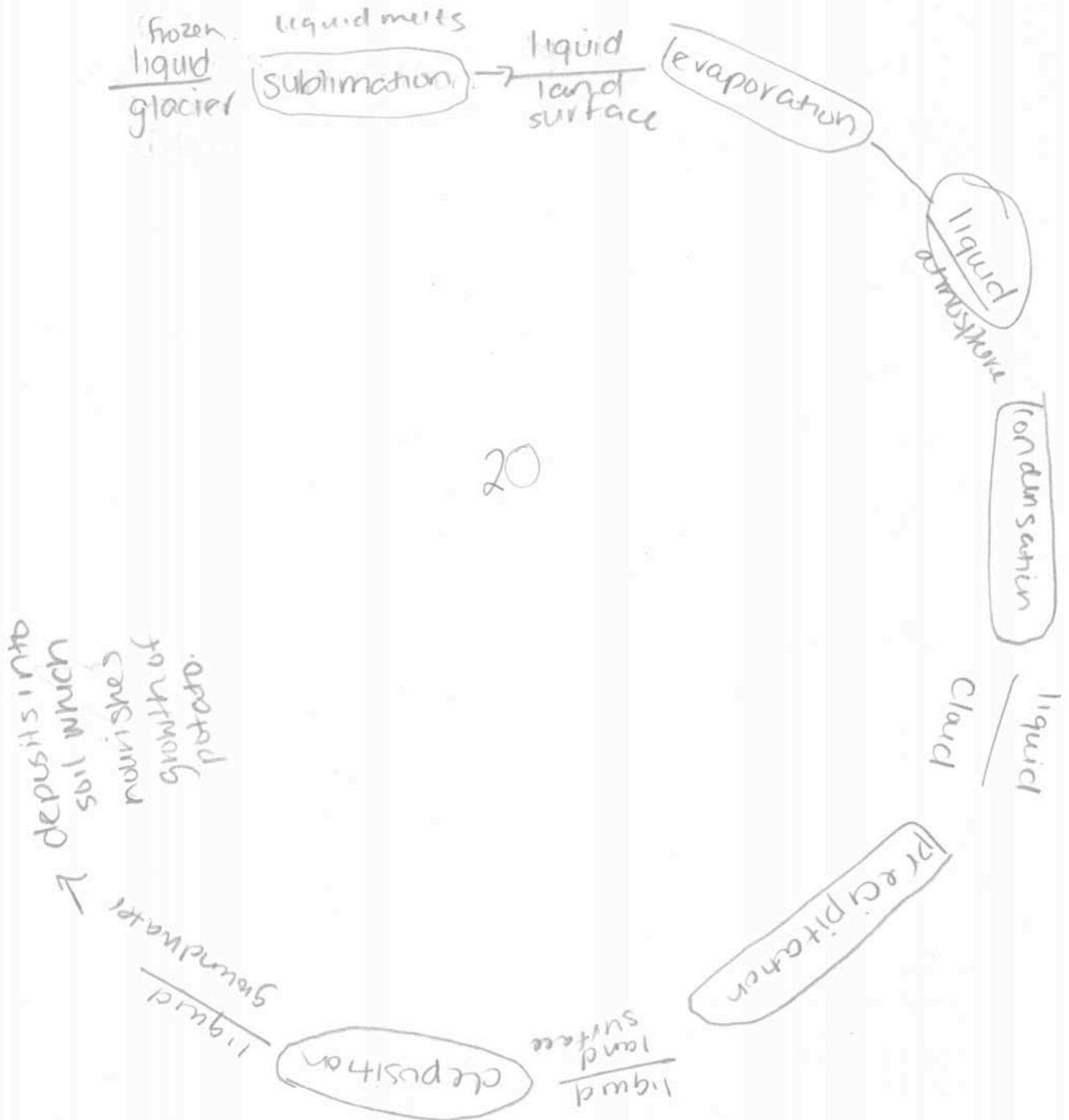
8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater  
b. been less  
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy  
b. Plants convert energy into biomass  
c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
  - A name for each process that moves or transforms water



2. When ice forms from seawater, the ice contains less salt than the remaining water. **Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes.** You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
  - The energy that is causing movement or transformation of water.

Since salt causes ice to melt, the seawater surrounding the polar ice wouldn't have the time to freeze as much as it normally would. Because the ice containing more salt would melt quicker enabling it to have its normal cooling effect to the water surrounding it. Therefore the circulation that would usually occur would be a lot different because the variance in water temperature would be smaller. Which ultimately would cause the water to be <sup>more</sup> warm than cold.

EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

YOUR SCORE:

42

STUDENT ID #: A40801547; GROUP #: H

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?

- ☐ a. Water molecules become larger  
☒ b. Gaseous water becomes liquid water  
☐ c. Hydrogen and oxygen atoms combine to form liquid water  
☐ d. The temperature of water molecules decreases

2. Which of the following is the largest freshwater reservoir

- ☐ a. The atmosphere  
☐ b. Oceans  
☒ c. Glaciers  
☐ d. Lakes and streams

3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?

- ☒ a. Rainfall and surface runoff into the lake  
☐ b. Seasonal high water from the Mississippi River  
☐ c. Ground water from beneath the surface

4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of condensation then becomes water in a glacier through the process of precipitation and then becomes water in clouds through the process of evaporation, condensation

- ☐ a. A = evaporation, B = deposition, C = sublimation  
☒ b. A = condensation, B = precipitation, C = evaporation  
☐ c. A = sublimation, B = precipitation, C = evaporation  
☐ d. A = precipitation, B = freezing, C = condensation

5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?

- ☐ a. Liquid water from the pot condenses  
☐ b. Liquid water from the pot evaporates  
☒ c. Water vapor from the pot condenses  
☐ d. Water vapor from the pot evaporates

evaporation = INVISIBLE

6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?

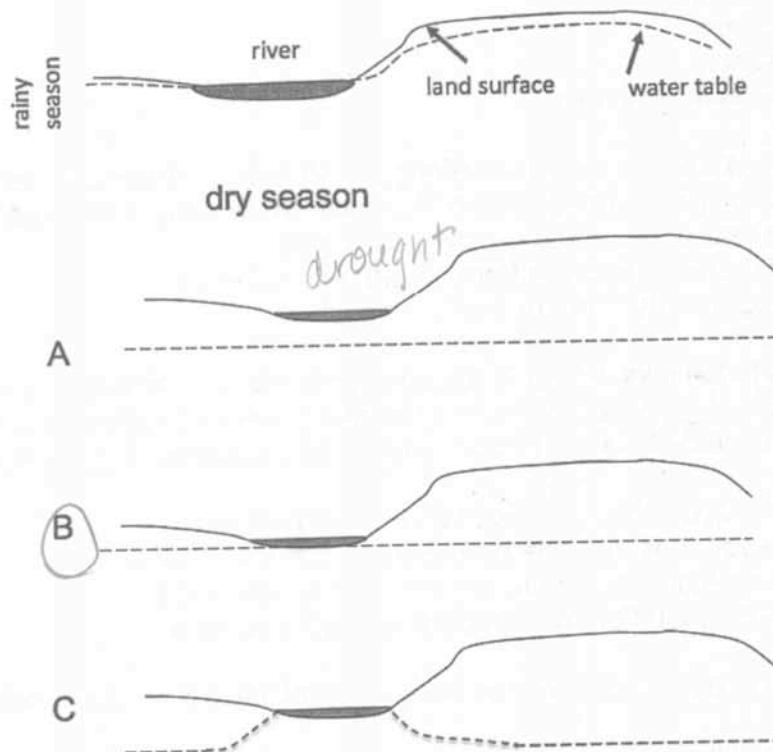
- ☒ a. This is what one would predict with global warming  
☐ b. This is the opposite of what one would predict with global warming  
☐ c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of gravitational energy. Water in the atmosphere becomes water in clouds as a result of thermal energy. Water in clouds becomes water in the atmosphere as the result of thermal energy.

- a. A = chemical, B = thermal, C = thermal  
b. A = gravitational, B = gravitational, C = thermal  
c. A = gravitational, B = thermal, C = thermal  
d. A = thermal, B = thermal, C = thermal

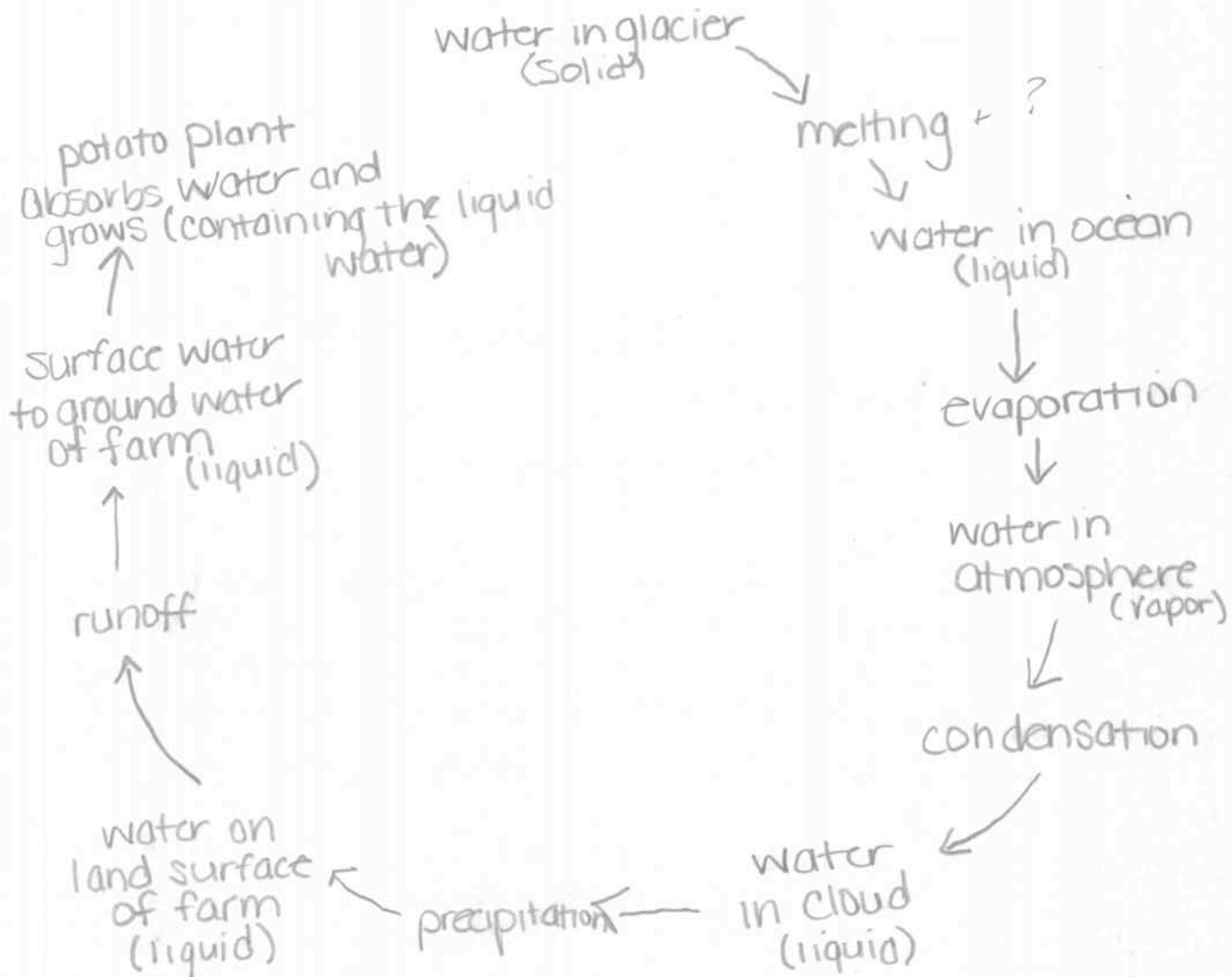
8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater  
b. been less  
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy  
b. Plants convert energy into biomass  
c. Plants release energy

**SHORT ANSWER. 25 points each (50 points total)**

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- a. Water phase at each step in the journey
  - b. A name for each process that moves or transforms water





2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
  - The energy that is causing movement or transformation of water.



Circulation occurs because water at the oceans surface is mostly ~~freshwater~~ because salt water is more dense, also at the ocean surface the water is evaporated leaving only the salt behind which then makes the freshwater more dense causing it to sink, and since that water is occupying the space it pushes up the freshwater.

If polar ice contained more salt than the surrounding seawater from which it freezes then the polar ice would be more dense than the surrounding water causing it to sink to the ocean floor and the bottom of the ocean would be solid ice.

EXTRA CREDIT (2 points)

2 EC. How are burning wood and respiration similar?

- ☒ They both destroy matter during energy conversion
- ☒ They both convert thermal energy into gravitational energy
- ☒ They both convert chemical energy into thermal energy
- ☐ They both convert kinetic energy into potential energy.

YOUR SCORE:

75



ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A46139440; GROUP #: H

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

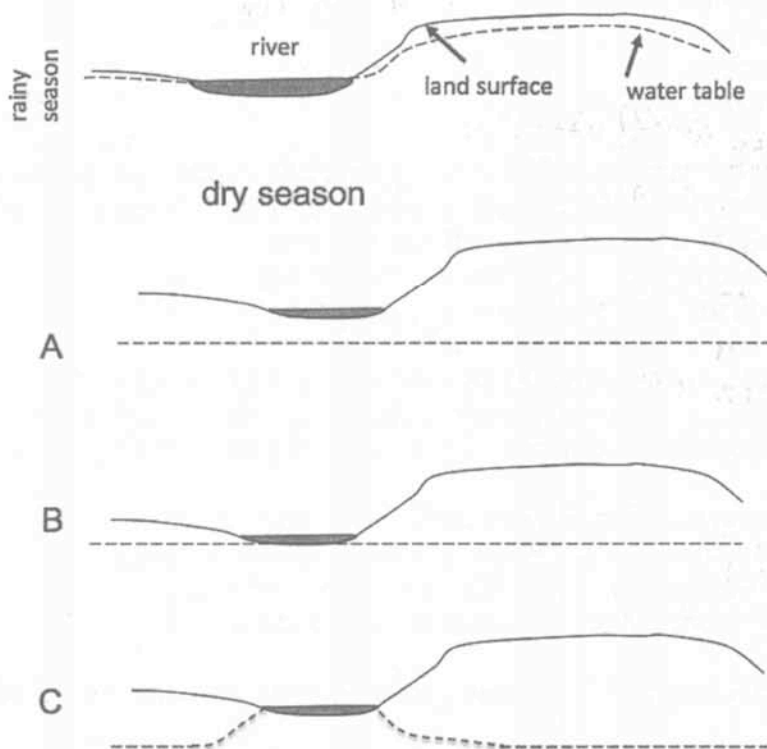
1. What happens when water molecules condense?  
a. Water molecules become larger  
b. Gaseous water becomes liquid water  
c. Hydrogen and oxygen atoms combine to form liquid water  
d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir  
a. The atmosphere  
b. Oceans  
c. Glaciers  
d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?  
a. Rainfall and surface runoff into the lake  
b. Seasonal high water from the Mississippi River  
c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of \_\_\_\_A\_\_\_\_, then becomes water in a glacier through the process of \_\_\_\_B\_\_\_\_, and then becomes water in clouds through the process of \_\_\_\_C\_\_\_\_.  
a. A= evaporation, B= deposition, C= sublimation  
b. A = condensation, B= precipitation, C= evaporation  
c. A= sublimation, B= precipitation, C= evaporation  
d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?  
a. Liquid water from the pot condenses  
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c. Water vapor from the pot condenses  
d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?  
a. This is what one would predict with global warming  
b. This is the opposite of what one would predict with global warming  
c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

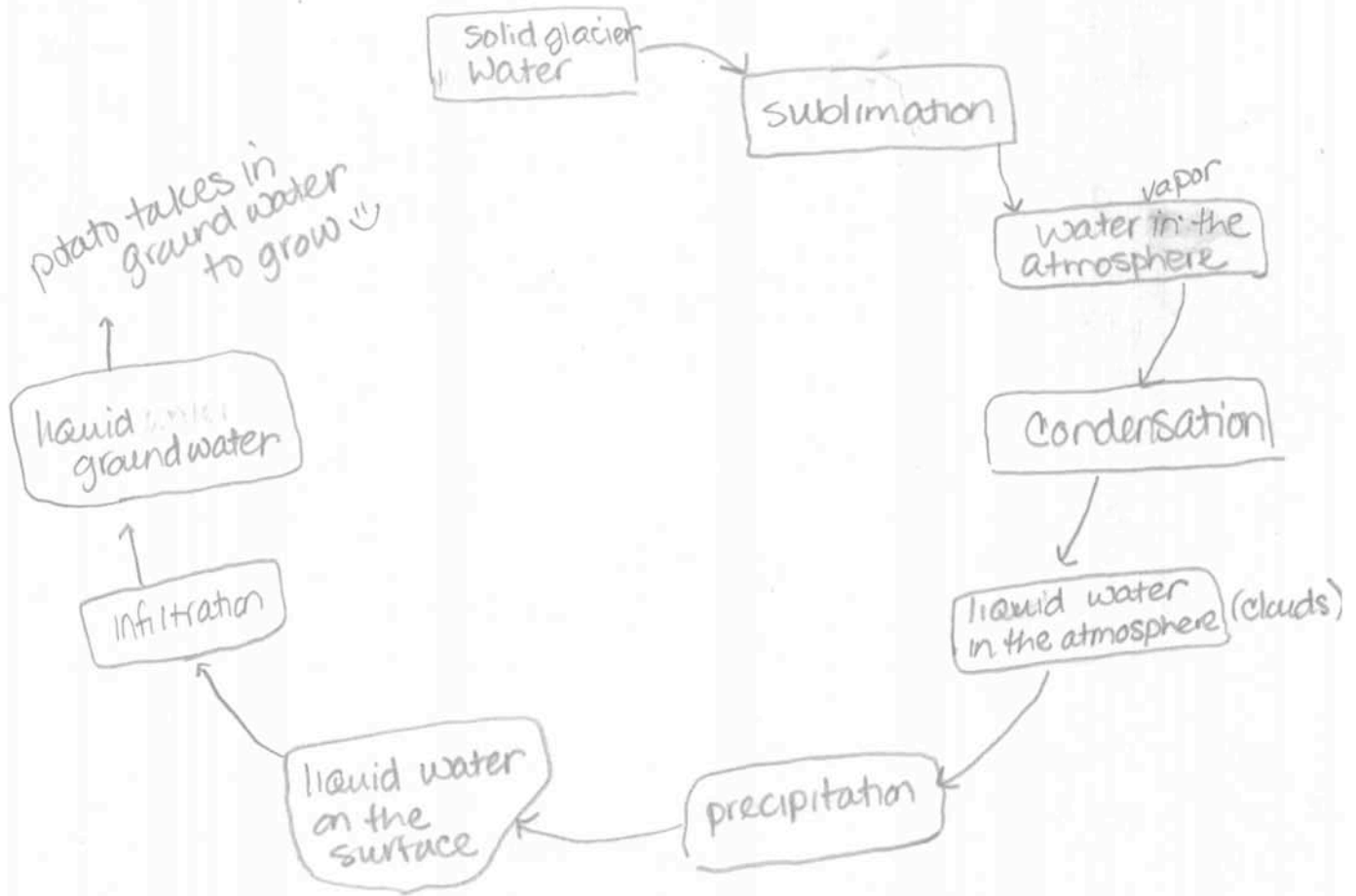
8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
  - b. been less
  - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
  - b. Plants convert energy into biomass
  - c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- a. Water phase at each step in the journey
  - b. A name for each process that moves or transforms water

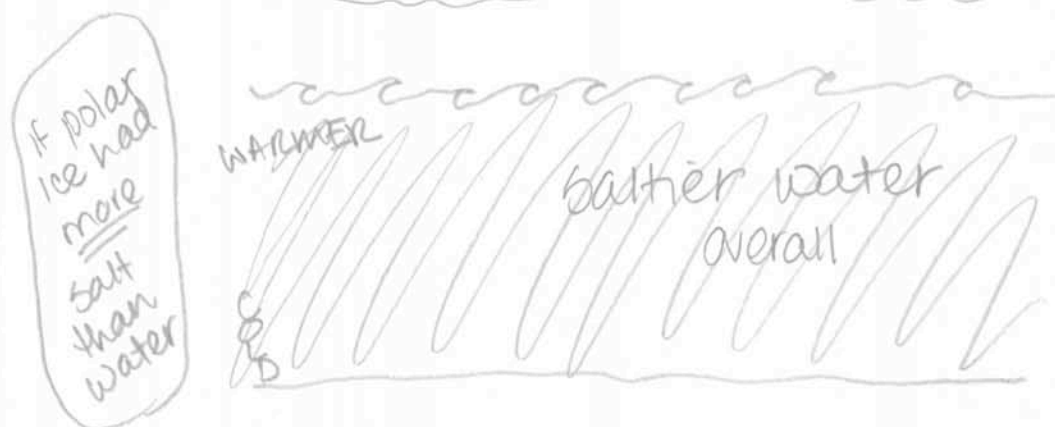
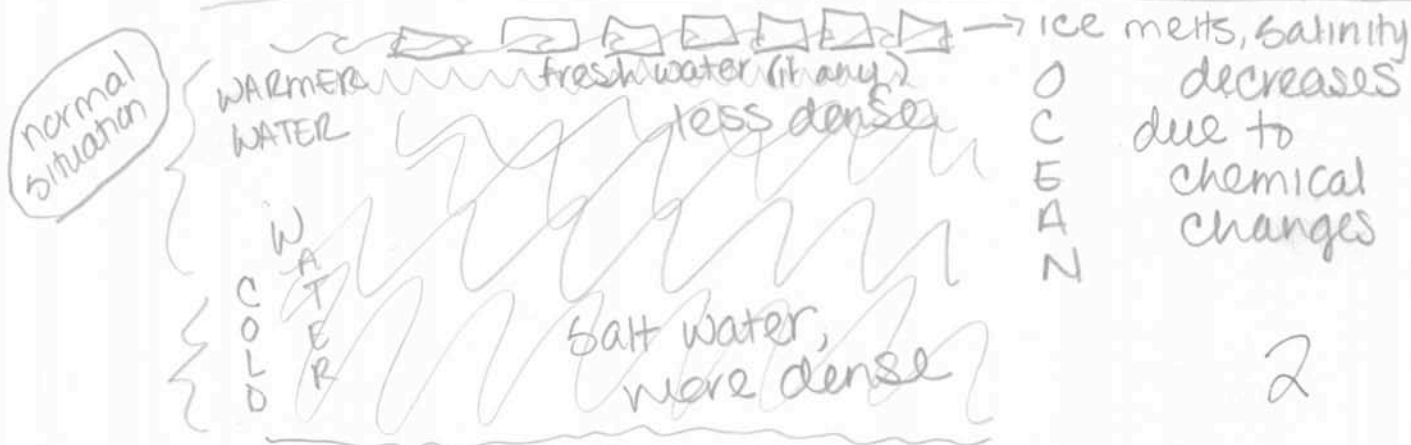


25

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

Salt water is naturally more dense than freshwater. If there were more salt on floating ice that came from seawater, when that ice melted (if it did), the salinity of the ocean would increase instead of decrease (in a real life situation, it decreases).



EXTRA CREDIT (2 points)

- 2 EC. How are burning wood and respiration similar?
- They both destroy matter during energy conversion
  - They both convert thermal energy into gravitational energy
  - They both convert chemical energy into thermal energy
  - They both convert kinetic energy into potential energy.

35 29

YOUR SCORE:

64

STUDENT ID #: A40250026; GROUP #: H

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

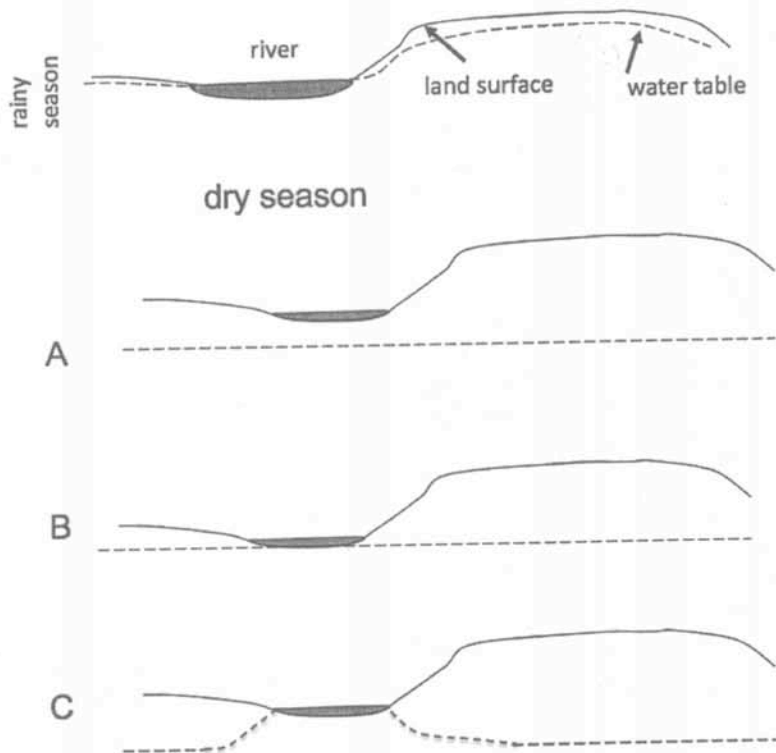
1. What happens when water molecules condense?  
a. Water molecules become larger  
b. Gaseous water becomes liquid water  
c. Hydrogen and oxygen atoms combine to form liquid water  
d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir  
a. The atmosphere  
b. Oceans  
c. Glaciers  
d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?  
a. Rainfall and surface runoff into the lake  
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4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of \_\_\_\_A\_\_\_\_, then becomes water in a glacier through the process of \_\_\_\_B\_\_\_\_, and then becomes water in clouds through the process of \_\_\_\_C\_\_\_\_.  
a. A= evaporation, B= deposition, C= sublimation  
b. A = condensation, B= precipitation, C= evaporation  
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d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?  
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6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?  
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ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

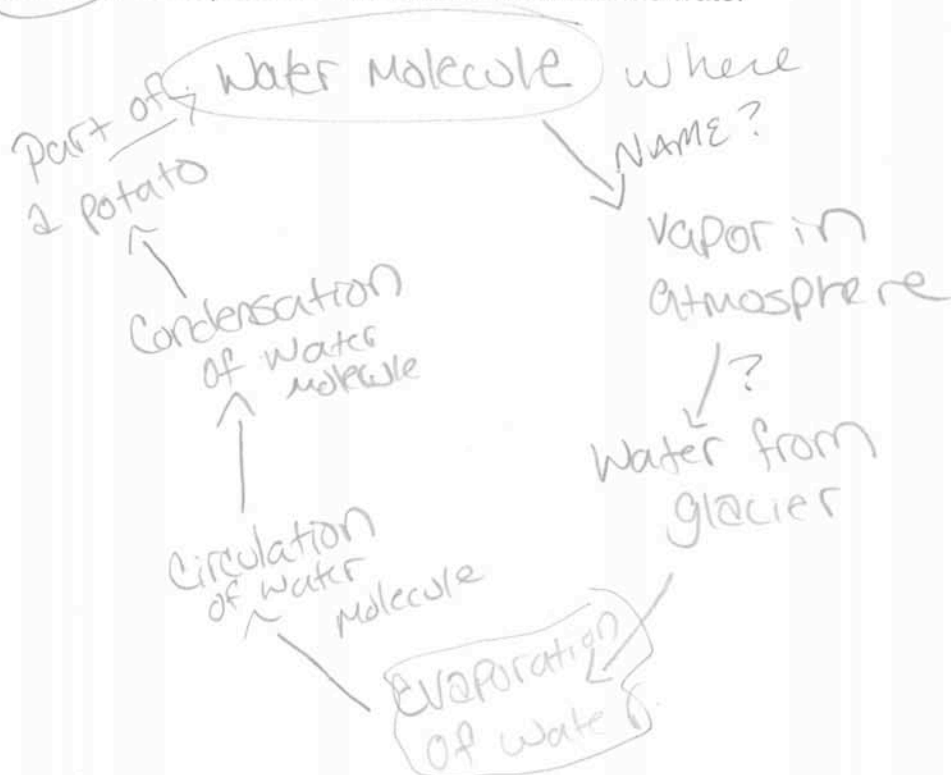


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
  - b. been less
  - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
  - b. Plants convert energy into biomass
  - c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water



In order for the Water molecule to move from a glacier to become part of a potato will be the process of the ? glacier and water molecule Evaporating from the atmosphere and Condensing itself to become part of the potato

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

Thermohaline circulation in oceans would change if polar ice contained more salt than the surrounding seawater from which it freezes mainly because the water would be less dense and it would cause gravitational energy to transform into thermal energy because of the temperature that it would cause to affect the seawater from freezing

2



..... = seawater

(X) = salt ions

EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- ☒ They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

YOUR SCORE:

32



STUDENT ID #: A42097140; GROUP #: I

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

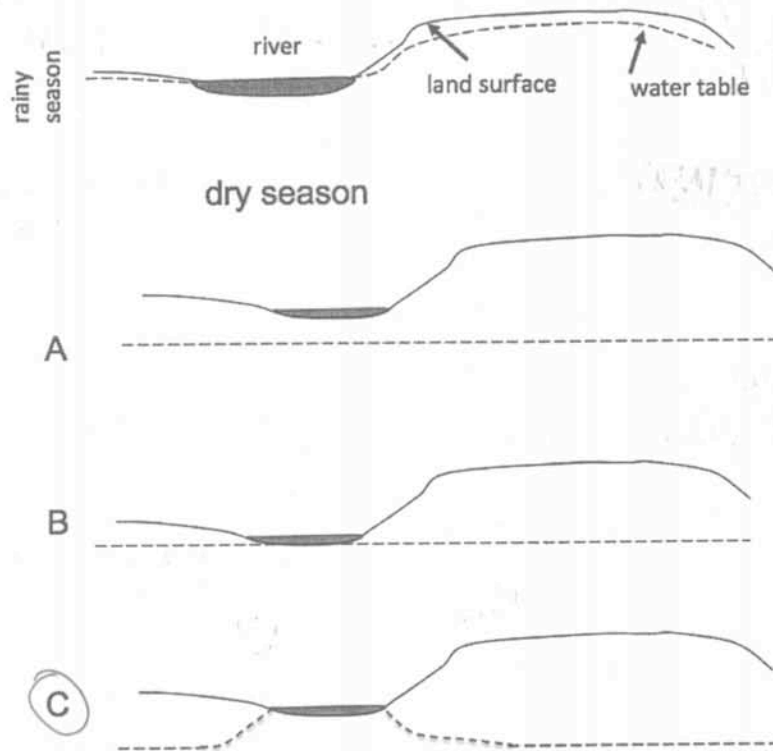
1. What happens when water molecules condense? 8
- a. Water molecules become larger
  - b. Gaseous water becomes liquid water
  - c. Hydrogen and oxygen atoms combine to form liquid water
  - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
- a. The atmosphere
  - b. Oceans
  - c. Glaciers
  - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
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- a. A= evaporation, B= deposition, C= sublimation
  - b. A = condensation, B= precipitation, C= evaporation
  - c. A= sublimation, B= precipitation, C= evaporation
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ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A = chemical, B = thermal, C = thermal  
b. A = gravitational, B = gravitational, C = thermal  
c. A = gravitational, B = thermal, C = thermal  
d. A = thermal, B = thermal, C = thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0 g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:

- a. been greater  
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c. remained the same

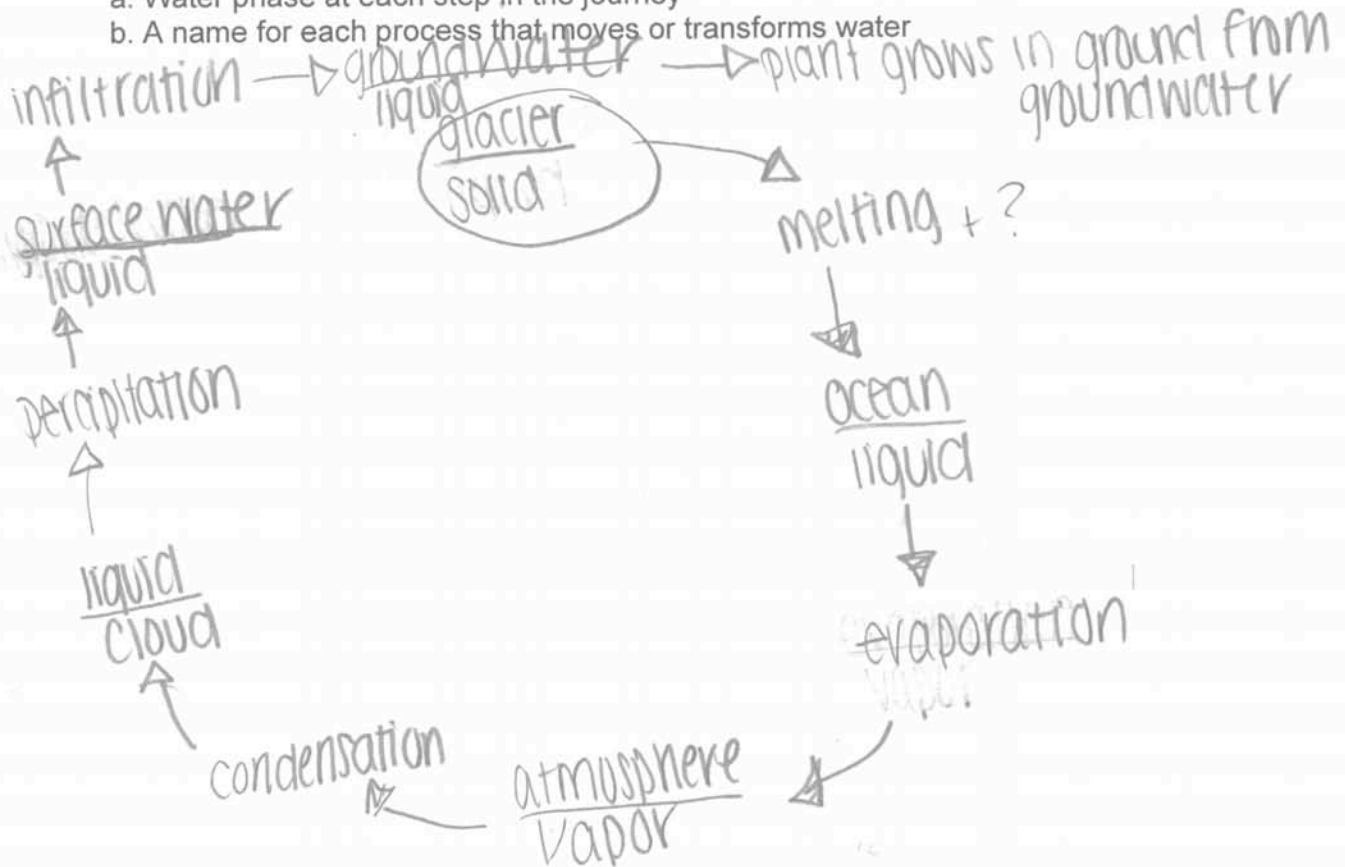
ice - .9g  
water - 1.0g

10. What happens when plants respire?  
a. Plants convert biomass into energy  
b. Plants convert energy into biomass  
c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water

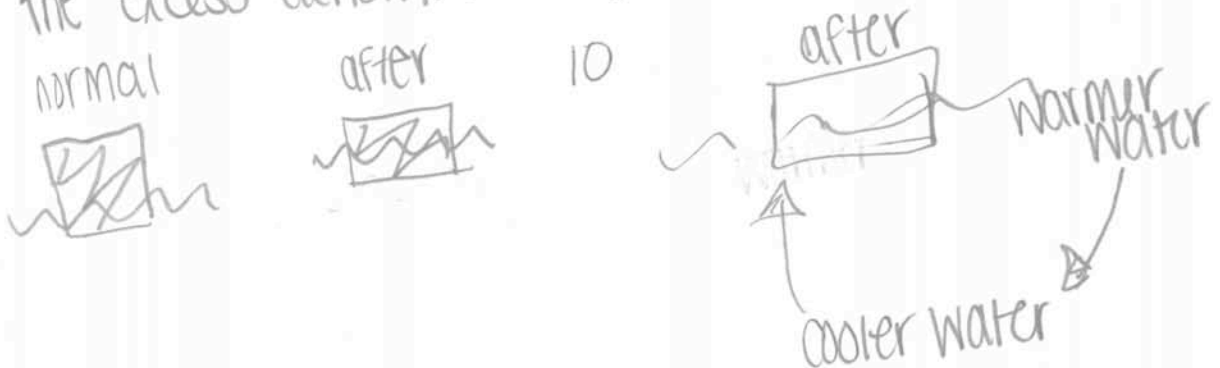


23

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

Ice in the seawater contains less salt than the remaining water which makes the ice less dense, which allows the ice to float in the water. If the polar ice contained more salt, the thermohaline circulation would be greatly effected because there would be less salt in the seawater which would cause a quicker rate of circulation of water since salt water is less dense than freshwater and therefore is able to move around faster. Also, the ice would be lower down in the seawater because it would slightly sink due to the excess density, making the sea level rise



EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

YOUR SCORE:

75

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A40006739; GROUP #: I

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

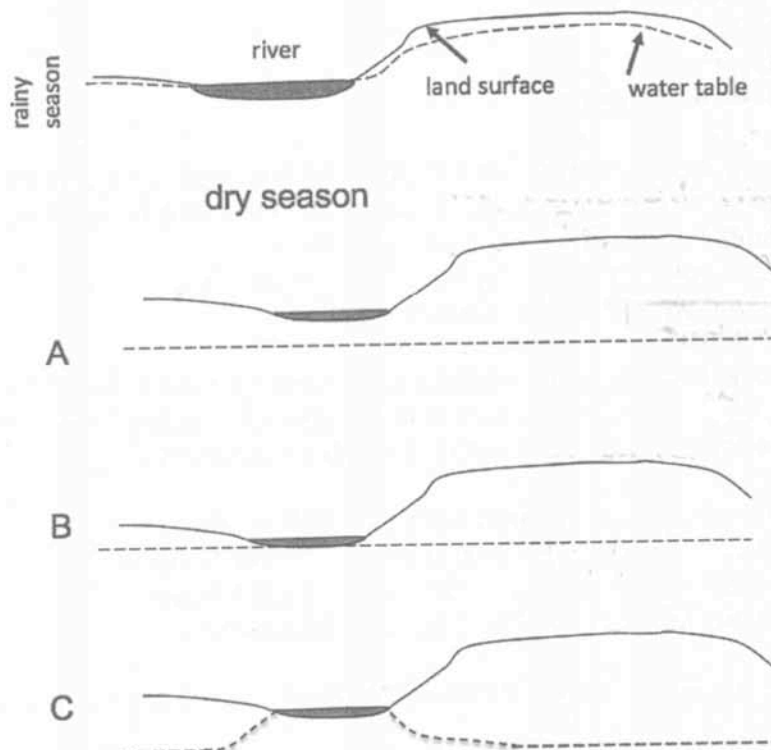
- 8
1. What happens when water molecules condense?  
a. Water molecules become larger  
☒ b. Gaseous water becomes liquid water  
c. Hydrogen and oxygen atoms combine to form liquid water  
d. The temperature of water molecules decreases
  2. Which of the following is the largest freshwater reservoir  
☒ a. The atmosphere  
b. Oceans  
c. Glaciers  
d. Lakes and streams
  3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?  
a. Rainfall and surface runoff into the lake  
b. Seasonal high water from the Mississippi River  
☒ c. Ground water from beneath the surface
  4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.  
a. A= evaporation, B= deposition, C= sublimation  
☒ b. A = condensation, B= precipitation, C= evaporation  
c. A= sublimation, B= precipitation, C= evaporation  
d. A = precipitation, B= freezing, C= condensation
  5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?  
a. Liquid water from the pot condenses  
b. Liquid water from the pot evaporates  
c. Water vapor from the pot condenses  
d. Water vapor from the pot evaporates
  6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?  
☒ a. This is what one would predict with global warming  
b. This is the opposite of what one would predict with global warming  
c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

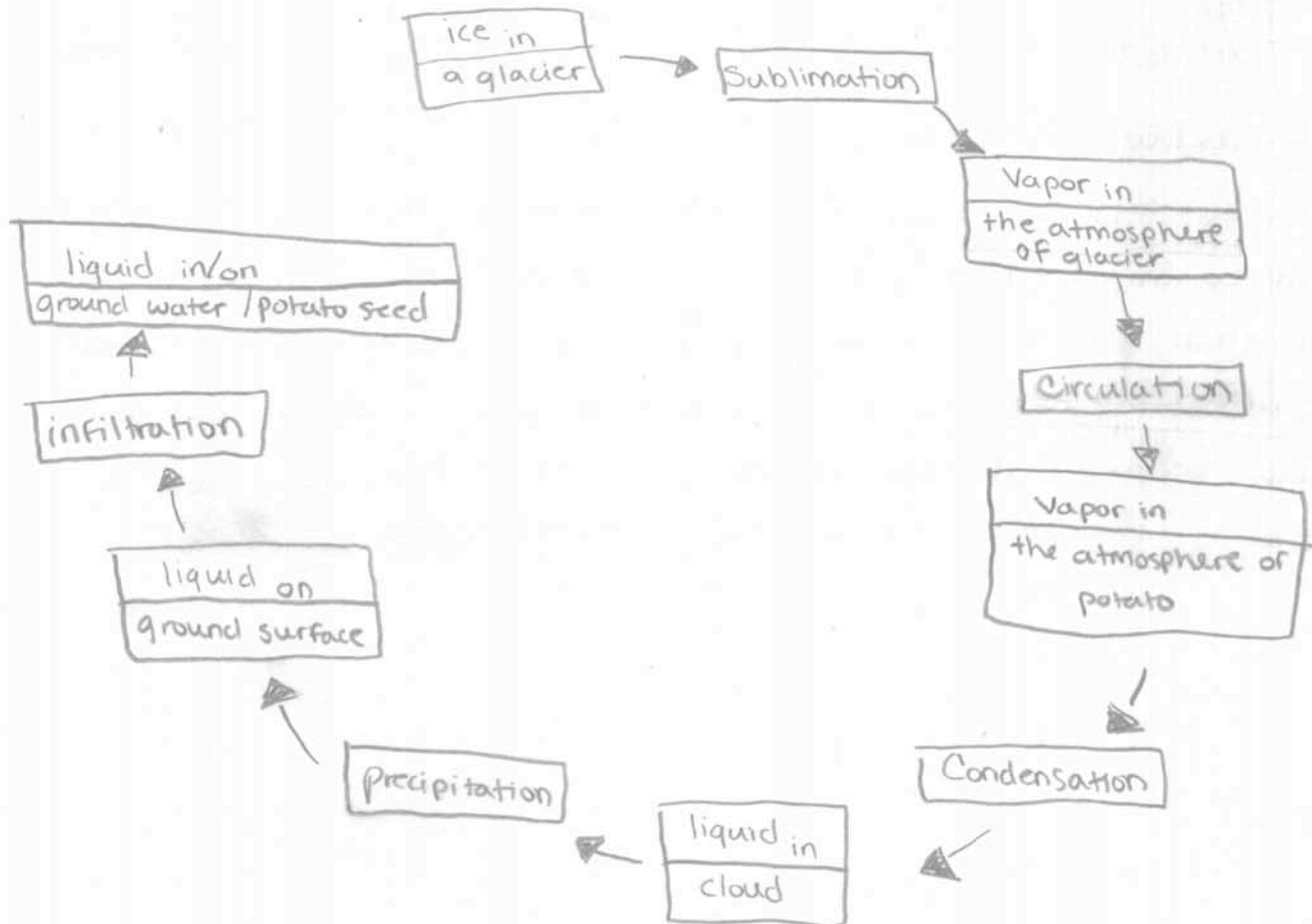
8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
  - b. been less
  - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
  - b. Plants convert energy into biomass
  - c. Plants release energy

**SHORT ANSWER. 25 points each (50 points total)**

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- a. Water phase at each step in the journey
  - b. A name for each process that moves or transforms water



25

2. When ice forms from seawater, the ice contains less salt than the remaining water. **Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes.** You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
  - b. The energy that is causing movement or transformation of water.

Thermohaline circulation is the process in which salt water sinks below freshwater in an ocean setting. This happens because cold water as well as salt water has a higher density than warm water and freshwater do. If polar ice contained more salt than the surrounding seawater from which it freezes then our bodies of water? would become more dense and more cold because of the thermohaline circulation and how it travels throughout all of the different bodies of water.

2

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- ☒ c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

YOUR SCORE:

69



ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A40840884; GROUP #: I

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?

- a. Water molecules become larger
- ☒ b. Gaseous water becomes liquid water
- c. Hydrogen and oxygen atoms combine to form liquid water
- d. The temperature of water molecules decreases

2. Which of the following is the largest freshwater reservoir

- a. The atmosphere
- b. Oceans
- ☒ c. Glaciers
- d. Lakes and streams

3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?

- a. Rainfall and surface runoff into the lake
- b. Seasonal high water from the Mississippi River
- ☒ c. Ground water from beneath the surface

4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.

- a. A= evaporation, B= deposition, C= sublimation
- ☒ b. A = condensation, B= precipitation, C= evaporation
- c. A= sublimation, B= precipitation, C= evaporation
- d. A = precipitation, B= freezing, C= condensation

5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?

- a. Liquid water from the pot condenses
- b. Liquid water from the pot evaporates
- ☒ c. Water vapor from the pot condenses
- d. Water vapor from the pot evaporates

*water vapor is inside, so it's the vapor condensing into a cloud, after the water in the pot evaporates.*

6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?

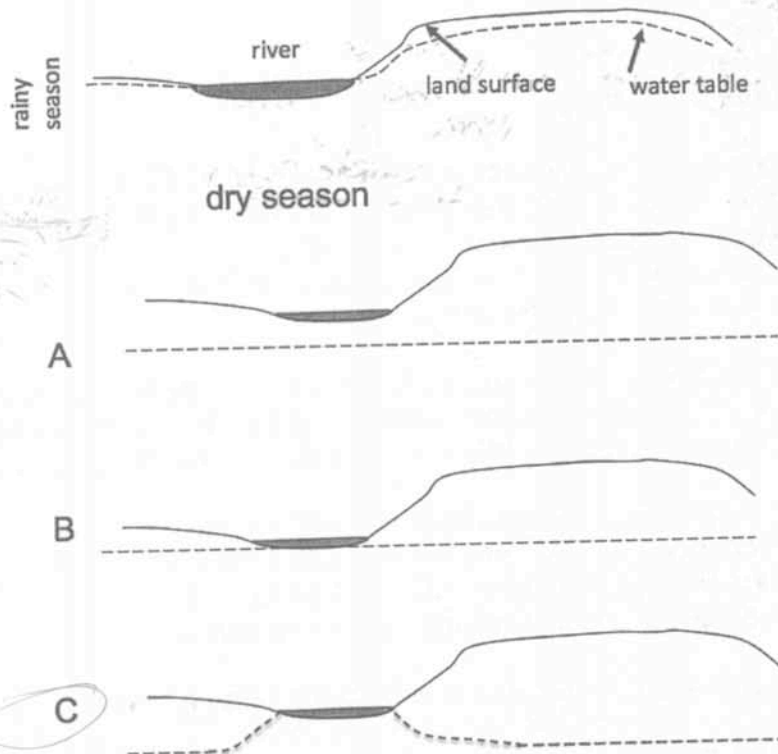
- ☒ a. This is what one would predict with global warming
- b. This is the opposite of what one would predict with global warming
- c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal  
b. A = gravitational, B= gravitational, C= thermal  
c. A = gravitational, B= thermal, C= thermal  
d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:

- a. been greater  
b. been less  
c. remained the same

*Ice would sink, sea level ↑  
Think about having too much ice in a glass of water.*

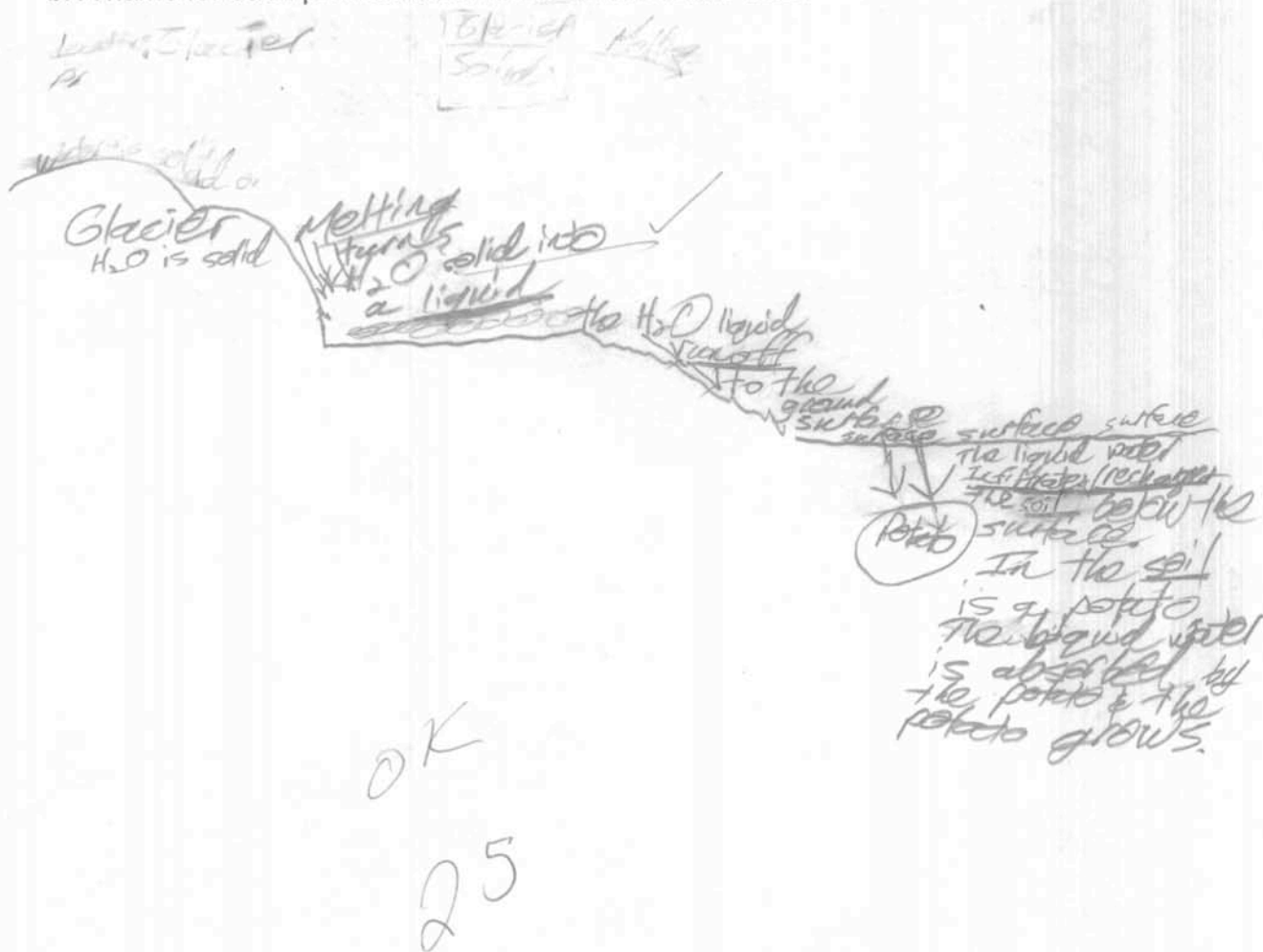
10. What happens when plants respire?

- a. Plants convert biomass into energy  
b. Plants convert energy into biomass  
c. Plants release energy

*ATP*

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- a. Water phase at each step in the journey
  - b. A name for each process that moves or transforms water



2. When ice forms from seawater, the ice contains less salt than the remaining water.

Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

Thermohaline circulation would change drastically because when deglaciation at the poles occurs, more salt would be going into the oceans. There would be so much salt going into the ocean that it would cause less buoyancy, & the warm water trying to rise would rise slower b/c of the addition of the denser salt.

Glacier at the pole  
salt sinks  
warm H<sub>2</sub>O  
cold water  
to much so higher than salt causing less buoyancy  
Harder for equilibrium to occur, less thermal energy near top  
for the world less dense water to move up.  
This would cause more cold water, lowering the temperature of the ocean.

EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

YOUR SCORE:

72

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A41696110; GROUP #: I

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?

- ☐ a. Water molecules become larger
- ☒ b. Gaseous water becomes liquid water
- ☐ c. Hydrogen and oxygen atoms combine to form liquid water
- ☐ d. The temperature of water molecules decreases

2. Which of the following is the largest freshwater reservoir

- ☐ a. The atmosphere
- ☐ b. Oceans
- ☒ c. Glaciers
- ☐ d. Lakes and streams

3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?

- ☐ a. Rainfall and surface runoff into the lake
- ☐ b. Seasonal high water from the Mississippi River
- ☒ c. Ground water from beneath the surface

4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of cond. A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C. precip.  
evap.

- a. A= evaporation, B= deposition, C= sublimation
- ☒ b. A = condensation, B= precipitation, C= evaporation
- c. A= sublimation, B= precipitation, C= evaporation
- d. A = precipitation, B= freezing, C= condensation

5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?

- ☐ a. Liquid water from the pot condenses
- ☐ b. Liquid water from the pot evaporates
- ☒ c. Water vapor from the pot condenses
- ☐ d. Water vapor from the pot evaporates

6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?

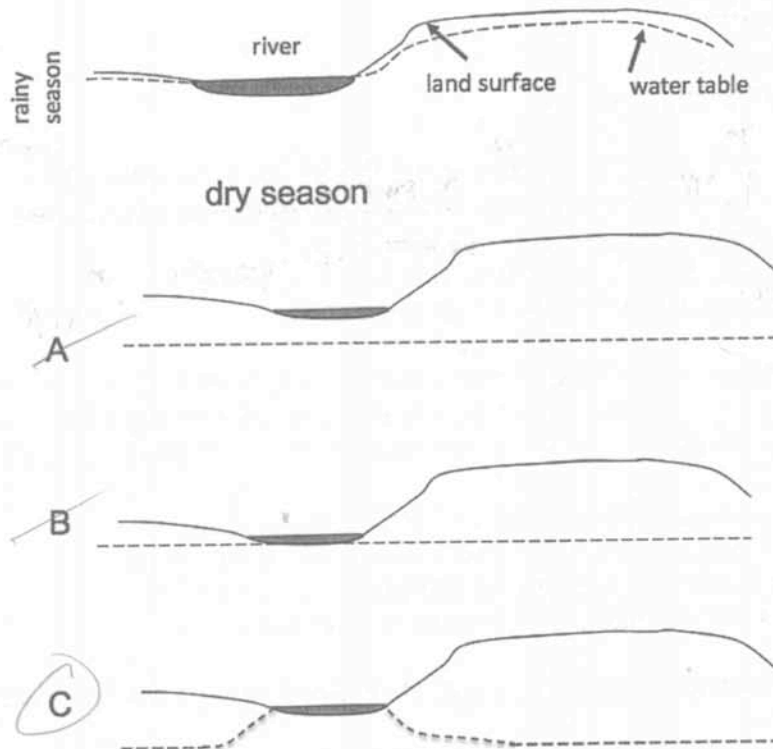
- ☒ a. This is what one would predict with global warming
- ☐ b. This is the opposite of what one would predict with global warming
- ☐ c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of grav. A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of therm. B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of therm. C \_\_\_\_\_ energy.

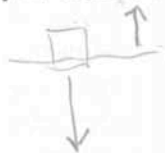
- a. A= chemical, B= thermal, C= thermal  
b. A = gravitational, B= gravitational, C= thermal  
c. A = gravitational, B= thermal, C= thermal  
d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:

- a. been greater  
b. been less  
c. remained the same



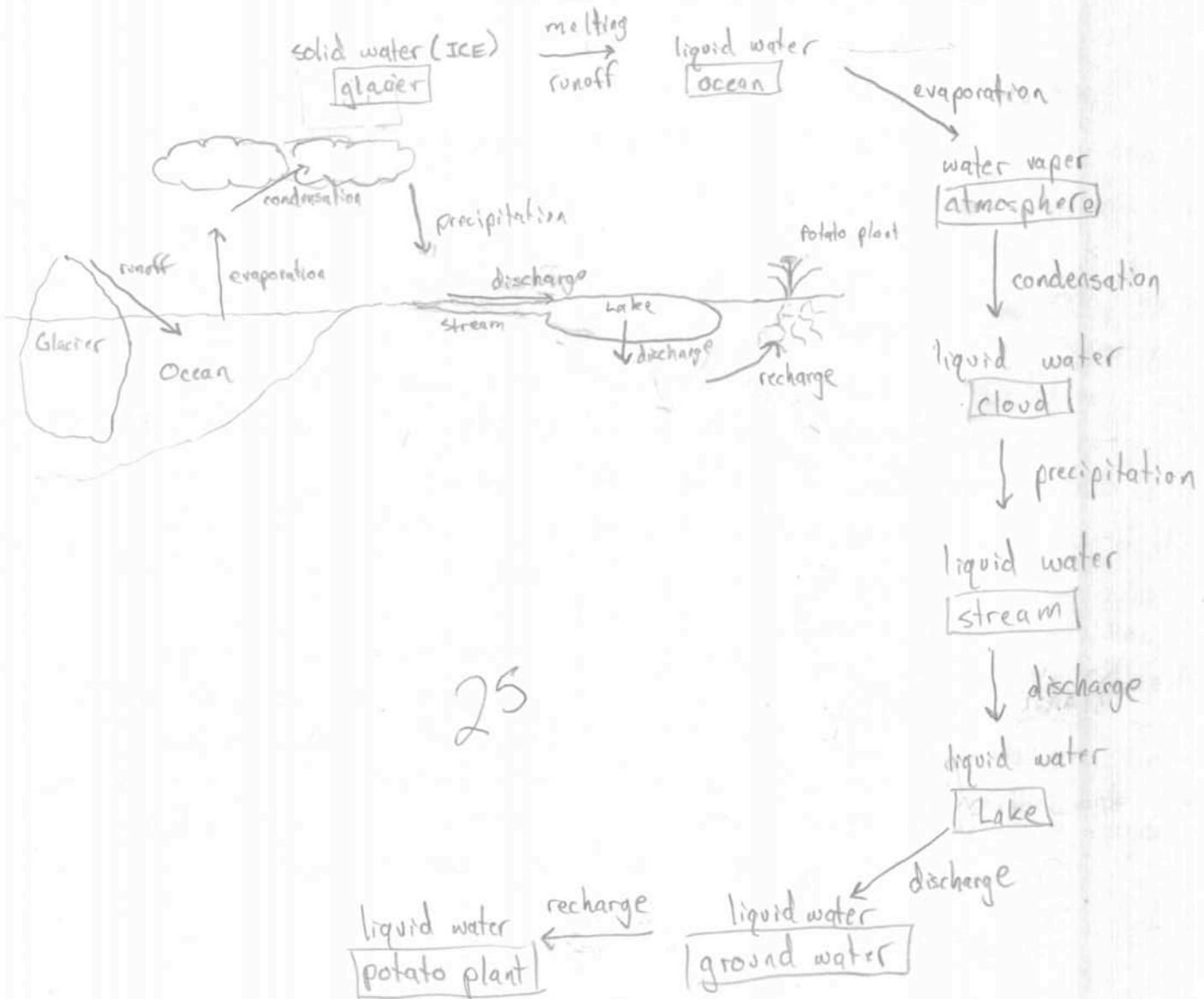
10. What happens when plants respire?

- a. Plants convert biomass into energy  
b. Plants convert energy into biomass  
c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water





2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

If polar ice contained more salt than the surrounding seawater from which it freezes, this would have an impact on thermohaline circulation. This would slow down the thermohaline circulation, if not stop it. Thermohaline circulation relies on the cold, salty water at the poles to sink. This is because as ice forms at the poles, it leaves salt behind. The more dense water sinks as a result of gravitational energy. In contrast, warm winds from the equator push the warm water heated by solar energy poleward, thus replacing the cold water. Once the colder water reaches warmer water it begins to warm and rise due to convection. The warm water is carried by the winds back to colder areas thus completing the circuit. If the cold water at the poles is less salty, due to polar ice containing more salt, it will be less dense and thus not sink. If there is no cold water to circulate it will slow down thermohaline circulation. It will still circulate because of the warm water coming into the poles, but the circulation will be slower and might not reach as many areas.



OK 25

EXTRA CREDIT (2 points)

2 EC. How are burning wood and respiration similar?

- ☒ They both destroy matter during energy conversion
- ☒ They both convert thermal energy into gravitational energy
- ☒ They both convert chemical energy into thermal energy
- ☒ They both convert kinetic energy into potential energy.

YOUR SCORE:

102 3



ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A42254860; GROUP #: J

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

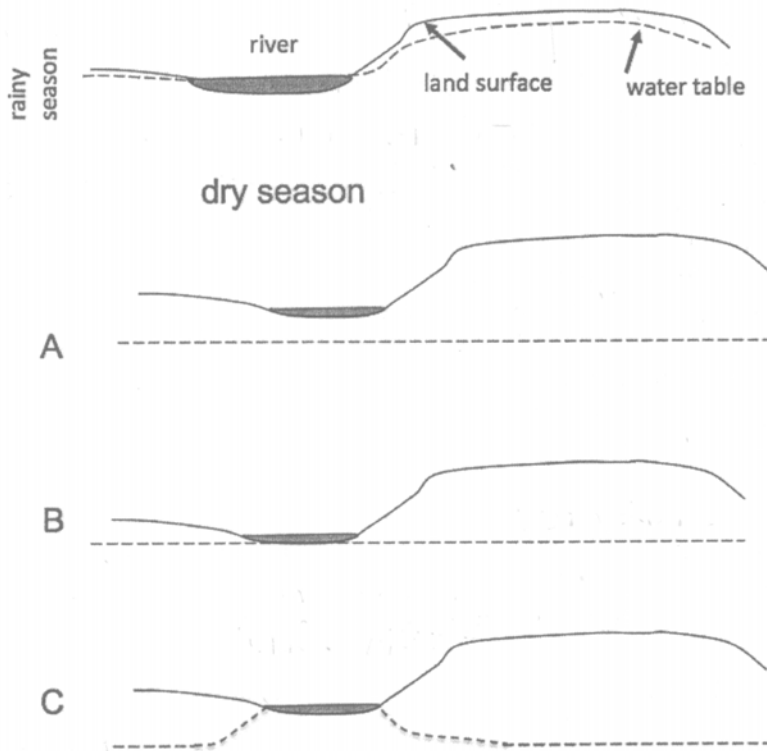
1. What happens when water molecules condense? 8
  - a. Water molecules become larger
  - b. Gaseous water becomes liquid water
  - c. Hydrogen and oxygen atoms combine to form liquid water
  - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
  - a. The atmosphere
  - b. Oceans
  - c. Glaciers
  - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
  - a. Rainfall and surface runoff into the lake
  - b. Seasonal high water from the Mississippi River
  - c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of \_\_\_\_A\_\_\_\_, then becomes water in a glacier through the process of \_\_\_\_B\_\_\_\_, and then becomes water in clouds through the process of \_\_\_\_C\_\_\_\_.
  - a. A= evaporation, B= deposition, C= sublimation
  - b. A = condensation, B= precipitation, C= evaporation
  - c. A= sublimation, B= precipitation, C= evaporation
  - d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
  - a. Liquid water from the pot condenses
  - b. Liquid water from the pot evaporates
  - c. Water vapor from the pot condenses
  - d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
  - a. This is what one would predict with global warming
  - b. This is the opposite of what one would predict with global warming
  - c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal  
b. A = gravitational, B= gravitational, C= thermal  
c. A = gravitational, B= thermal, C= thermal  
d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

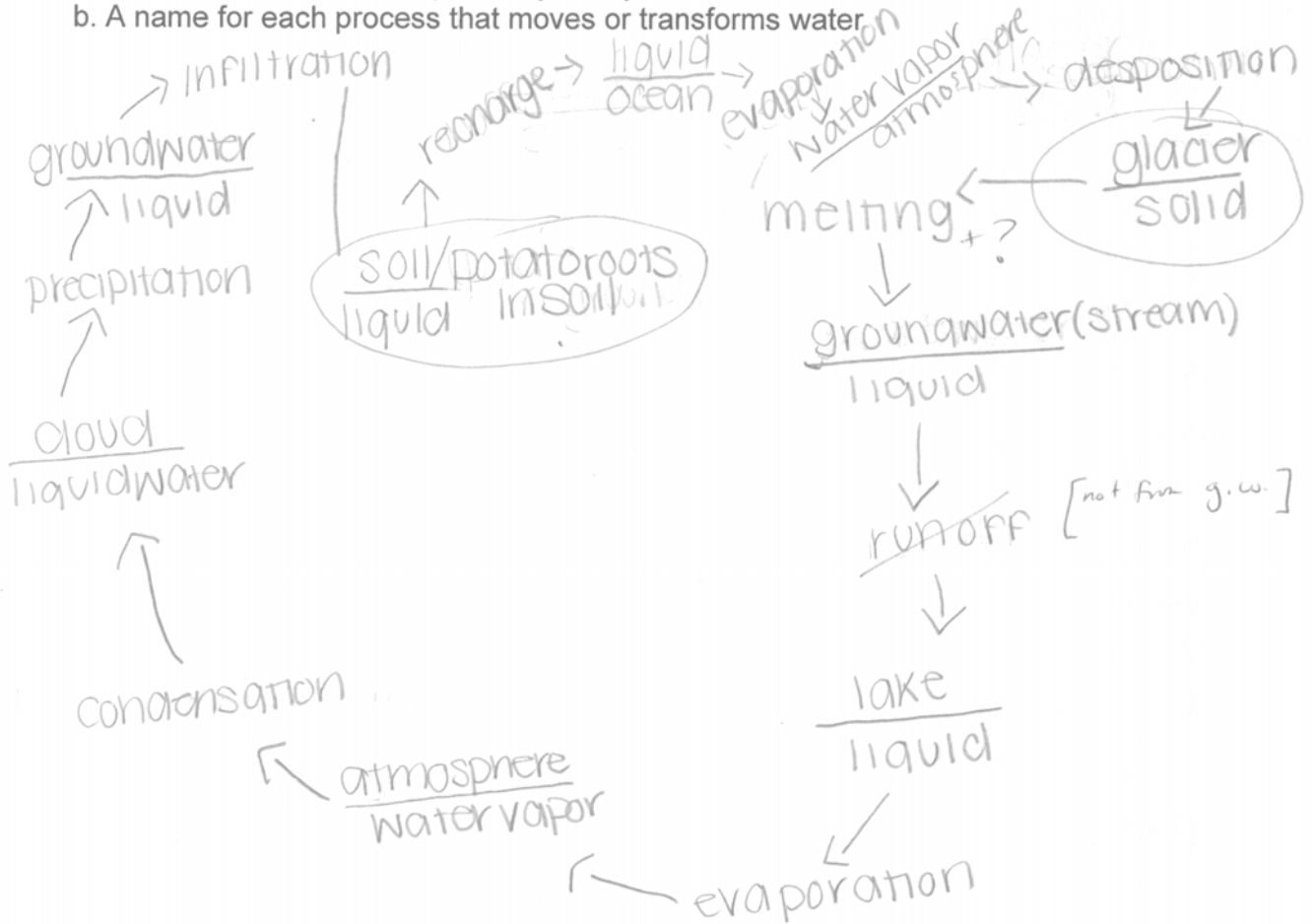


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater  
b. been less  
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy  
b. Plants convert energy into biomass  
c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

The thermohaline circulation would be changed if polar ice contained more salt than the seawater it freezes from. Ocean circulation is based on the density of the water, which is measured by the temperature and salinity of the water. Typically, less dense, warm water flows towards the cooler polar regions before sinking down as it becomes cooler, being replaced by cooler, less dense water. If ice was forming and taking away salt ions, the density of the water will change since the salinity has changed. (Water with less salinity will have more a greater density, which means it will cool more quickly and not be able to go as far to exchange water with the cooler, more dense waters on polar areas. An increased lack of warm water could effect the polar regions as well.

I had to guess because I didn't know if it would make it more dense or less dense why not?

18

EXTRA CREDIT (2 points)

2 EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

YOUR SCORE:

82

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: 41069790; GROUP #: J

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

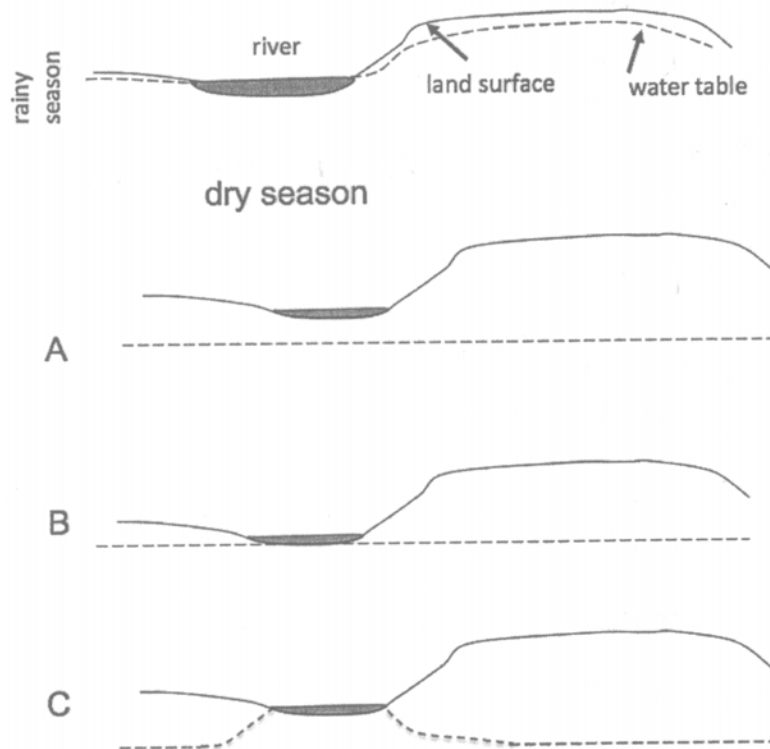
- 7
1. What happens when water molecules condense?  
a. Water molecules become larger  
b. ☒ Gaseous water becomes liquid water  
c. Hydrogen and oxygen atoms combine to form liquid water  
d. The temperature of water molecules decreases
  2. Which of the following is the largest freshwater reservoir  
a. The atmosphere  
b. Oceans  
c. ☒ Glaciers  
d. Lakes and streams
  3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?  
a. ☒ Rainfall and surface runoff into the lake  
b. Seasonal high water from the Mississippi River  
c. ☒ Ground water from beneath the surface
  4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of \_\_\_\_A\_\_\_\_, then becomes water in a glacier through the process of \_\_\_\_B\_\_\_\_, and then becomes water in clouds through the process of \_\_\_\_C\_\_\_\_.  
a. A= evaporation, B= deposition, C= sublimation  
b. ☒ A = condensation, B= precipitation, C= evaporation  
c. A= sublimation, B= precipitation, C= evaporation  
d. A = precipitation, B= freezing, C= condensation
  5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?  
a. Liquid water from the pot condenses  
b. Liquid water from the pot evaporates  
c. ☒ Water vapor from the pot condenses  
d. Water vapor from the pot evaporates
  6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?  
a. ☒ This is what one would predict with global warming  
b. This is the opposite of what one would predict with global warming  
c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal  
b. A = gravitational, B= gravitational, C= thermal  
c. A = gravitational, B= thermal, C= thermal  
d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:

- a. been greater  
b. been less  
c. remained the same

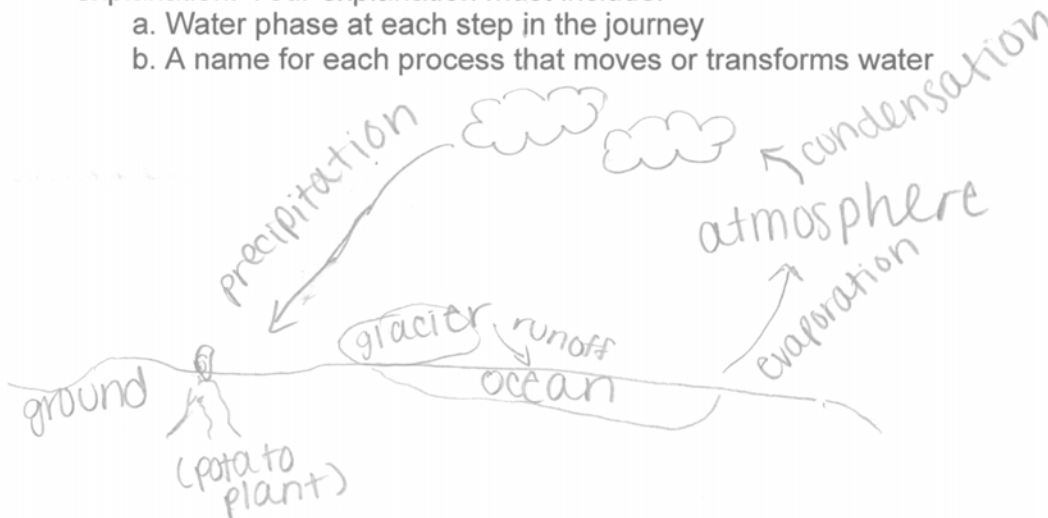
10. What happens when plants respire?

- a. Plants convert biomass into energy  
b. Plants convert energy into biomass  
c. Plants release energy

(transpire)

**SHORT ANSWER. 25 points each (50 points total)**

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
  - A name for each process that moves or transforms water



- ① A water molecule in a glacier would melt and runoff into the ocean. (in the form of a solid)
- ② The water molecule in the ocean would evaporate into the atmosphere and turn into a liquid gas (water vapor).
- ③ The gas would then condense to form liquid water droplets in a cloud.
- ④ The water molecule in the cloud would then go back into the atmosphere (ground) through precipitation (in the form of a liquid.)
- ⑤ The potato would soak up the liquid water.

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

I think that there would be no change in thermohaline circulation in oceans because the same amount of salt would end up in the oceans through the cycle of melting and then freezing of the sea water into the polar ice.

The energy that causes the movement of the water salt in the water is thermal potential energy, as well as chemical energy (from the liquid state of the seawater into the solid state of the water).

2

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

35 28

YOUR SCORE:

63



ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: 42101752; GROUP #: J

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

1. What happens when water molecules condense? 8
  - a. Water molecules become larger
  - b. Gaseous water becomes liquid water
  - c. Hydrogen and oxygen atoms combine to form liquid water
  - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
  - a. The atmosphere
  - b. Oceans
  - c. Glaciers
  - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
  - a. Rainfall and surface runoff into the lake
  - b. Seasonal high water from the Mississippi River
  - c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of \_\_\_\_\_A\_\_\_\_\_, then becomes water in a glacier through the process of \_\_\_\_\_B\_\_\_\_\_, and then becomes water in clouds through the process of \_\_\_\_\_C\_\_\_\_\_.
  - a. A= evaporation, B= deposition, C= sublimation
  - b. A = condensation, B= precipitation, C= evaporation
  - c. A= sublimation, B= precipitation, C= evaporation
  - d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
  - a. Liquid water from the pot condenses
  - b. Liquid water from the pot evaporates
  - c. Water vapor from the pot condenses
  - d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
  - a. This is what one would predict with global warming
  - b. This is the opposite of what one would predict with global warming
  - c. Predictions about global warming do not address global precipitation.

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
  - b. The energy that is causing movement or transformation of water.

The circulation would be different if the polar ice contained more salt than surrounding seawater because it would make the water more dense than what it was. This increased density would manipulate the circulation because the less dense fresh water would be overpowered by the more dense seawater. It would make the currents in the water change because when the more salty polar ice it would freeze at a lower point than the other ice so it would interrupt the thermohaline circulation. The warmer thermal energy circulating to the poles would mess up the freezing of the cold-salty ocean water near the poles.

warmer fresh water

2

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- ☒ c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

YOUR SCORE:

64

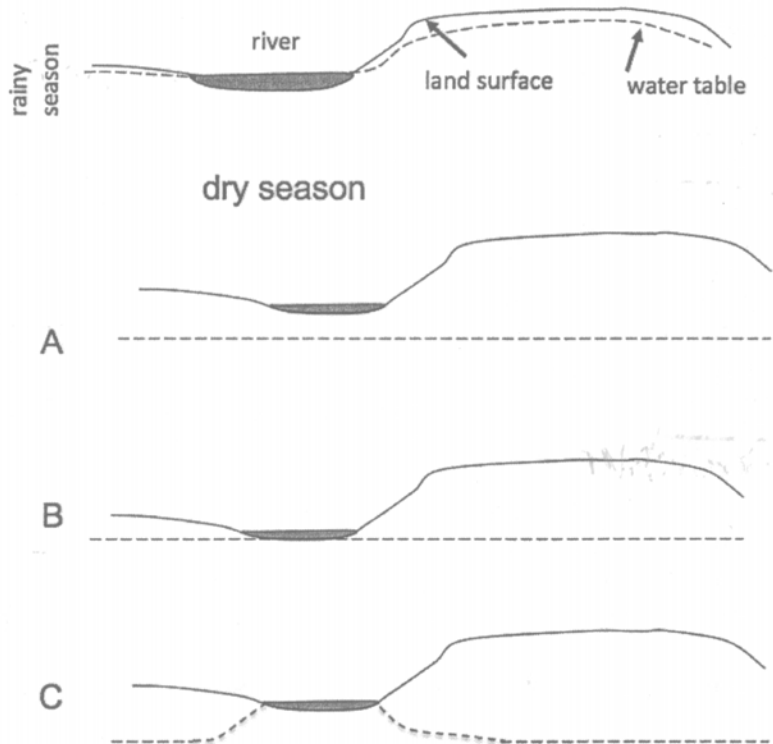
ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

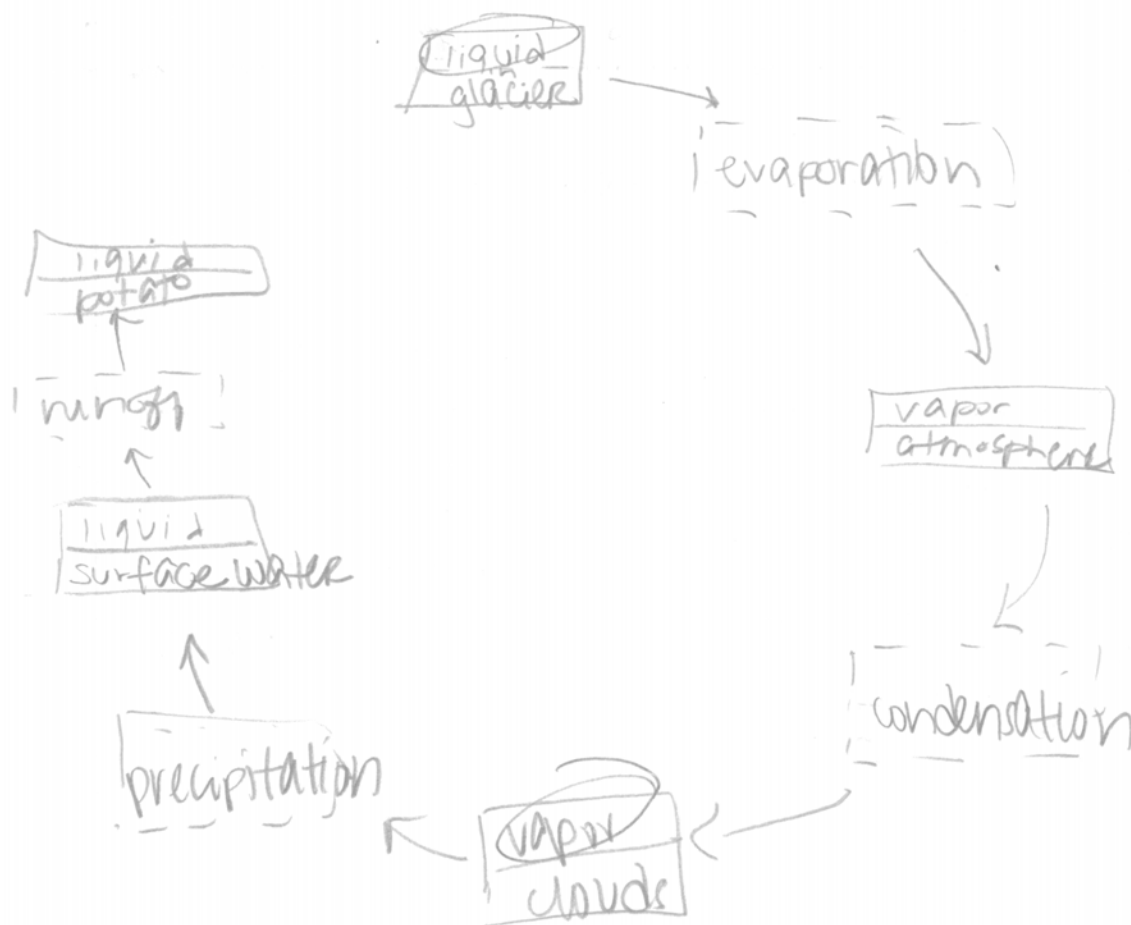
8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
  - b. been less
  - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
  - b. Plants convert energy into biomass
  - c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
  - A name for each process that moves or transforms water



STUDENT ID #: A43338446; GROUP #: J

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

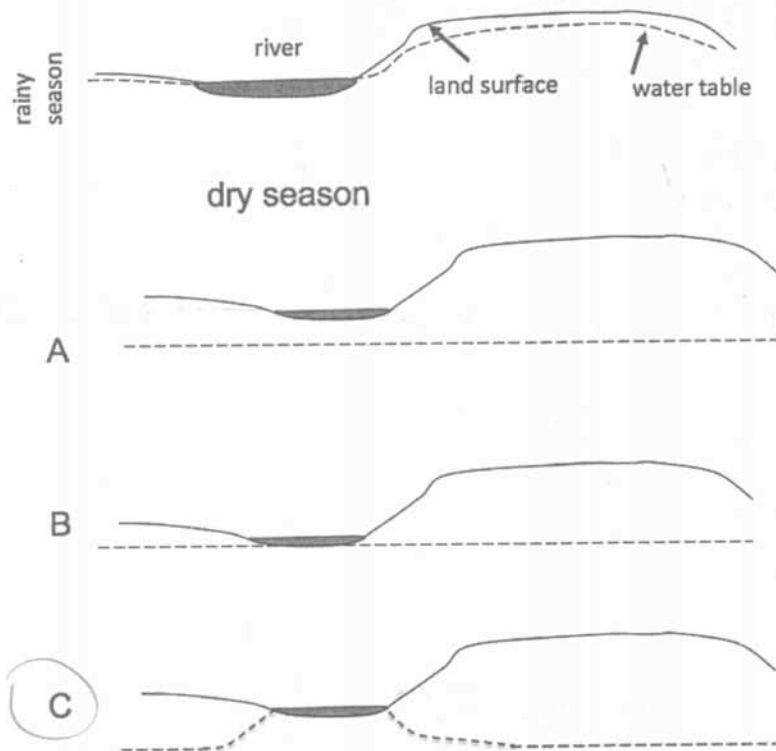
1. What happens when water molecules condense? 8
  - a. Water molecules become larger
  - b. Gaseous water becomes liquid water
  - ☒ c. Hydrogen and oxygen atoms combine to form liquid water
  - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir?
  - a. The atmosphere
  - b. Oceans
  - ☒ c. Glaciers
  - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
  - ☒ a. Rainfall and surface runoff into the lake
  - b. Seasonal high water from the Mississippi River
  - c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of \_\_\_\_A\_\_\_\_, then becomes water in a glacier through the process of \_\_\_\_B\_\_\_\_, and then becomes water in clouds through the process of \_\_\_\_C\_\_\_\_.
  - a. A= evaporation, B= deposition, C= sublimation
  - ☒ b. A = condensation, B= precipitation, C= evaporation
  - c. A= sublimation, B= precipitation, C= evaporation
  - d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
  - a. Liquid water from the pot condenses
  - ☒ b. Liquid water from the pot evaporates
  - c. Water vapor from the pot condenses
  - d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
  - ☒ a. This is what one would predict with global warming
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ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
  - b. been less
  - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
  - b. Plants convert energy into biomass
  - c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
  - A name for each process that moves or transforms water

- The ice in the glacier melts and produces runoff into a stream.



- water in the stream evaporates into the atmosphere.



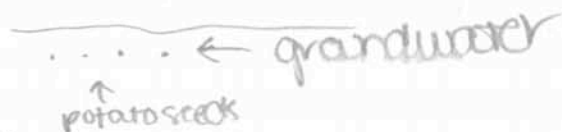
- water vapor in the atmosphere condenses into clouds



- precipitation comes from the clouds and soaks into the ground, becoming groundwater, on a potato farm.



25



- the groundwater gets absorbed by the potato seeds, and they grow into potatoes.

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
  - b. The energy that is causing movement or transformation of water.

If polar ice contained more salt than the seawater in which it froze from, thermohaline circulation would change. Because this process is a circulation, the overly salted ice would eventually melt, bringing more salt into the warmer water. This process would slowly build up the salt in the ocean until it effected the evaporation of the water, throwing the water cycle out of equilibrium.

2



EXTRA CREDIT (2 points)

- 2 EC. How are burning wood and respiration similar?
- a. They both destroy matter during energy conversion
  - b. They both convert thermal energy into gravitational energy
  - c. They both convert chemical energy into thermal energy
  - d. They both convert kinetic energy into potential energy.

YOUR SCORE:

69



STUDENT ID #: A43682453; GROUP #: K

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

- 9
1. What happens when water molecules condense?  
a. Water molecules become larger  
☒ b. Gaseous water becomes liquid water  
c. Hydrogen and oxygen atoms combine to form liquid water  
d. The temperature of water molecules decreases
  2. Which of the following is the largest freshwater reservoir  
a. The atmosphere  
b. Oceans  
☒ c. Glaciers  
d. Lakes and streams
  3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?  
a. Rainfall and surface runoff into the lake  
b. Seasonal high water from the Mississippi River  
☒ c. Ground water from beneath the surface
  4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of \_\_\_\_A\_\_\_\_, then becomes water in a glacier through the process of \_\_\_\_B\_\_\_\_, and then becomes water in clouds through the process of \_\_\_\_C\_\_\_\_.  
a. A= evaporation, B= deposition, C= sublimation  
☒ b. A = condensation, B= precipitation, C= evaporation  
c. A= sublimation, B= precipitation, C= evaporation  
d. A = precipitation, B= freezing, C= condensation
  5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?  
a. Liquid water from the pot condenses  
b. Liquid water from the pot evaporates  
c. Water vapor from the pot condenses  
☒ d. Water vapor from the pot evaporates
  6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?  
☒ a. This is what one would predict with global warming  
b. This is the opposite of what one would predict with global warming  
c. Predictions about global warming do not address global precipitation.

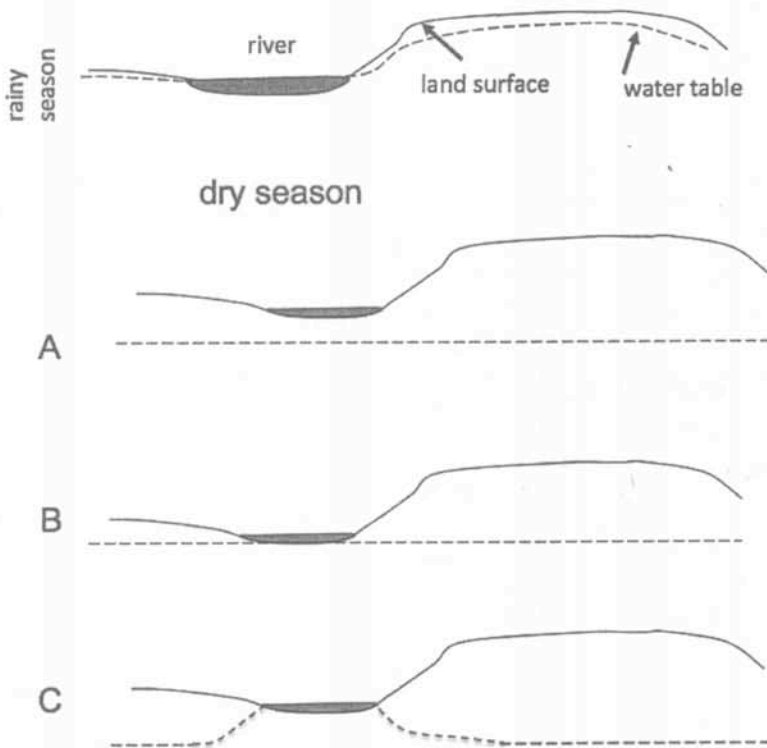
ISP 203A: GLOBAL CHANGE  
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- ☒ c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

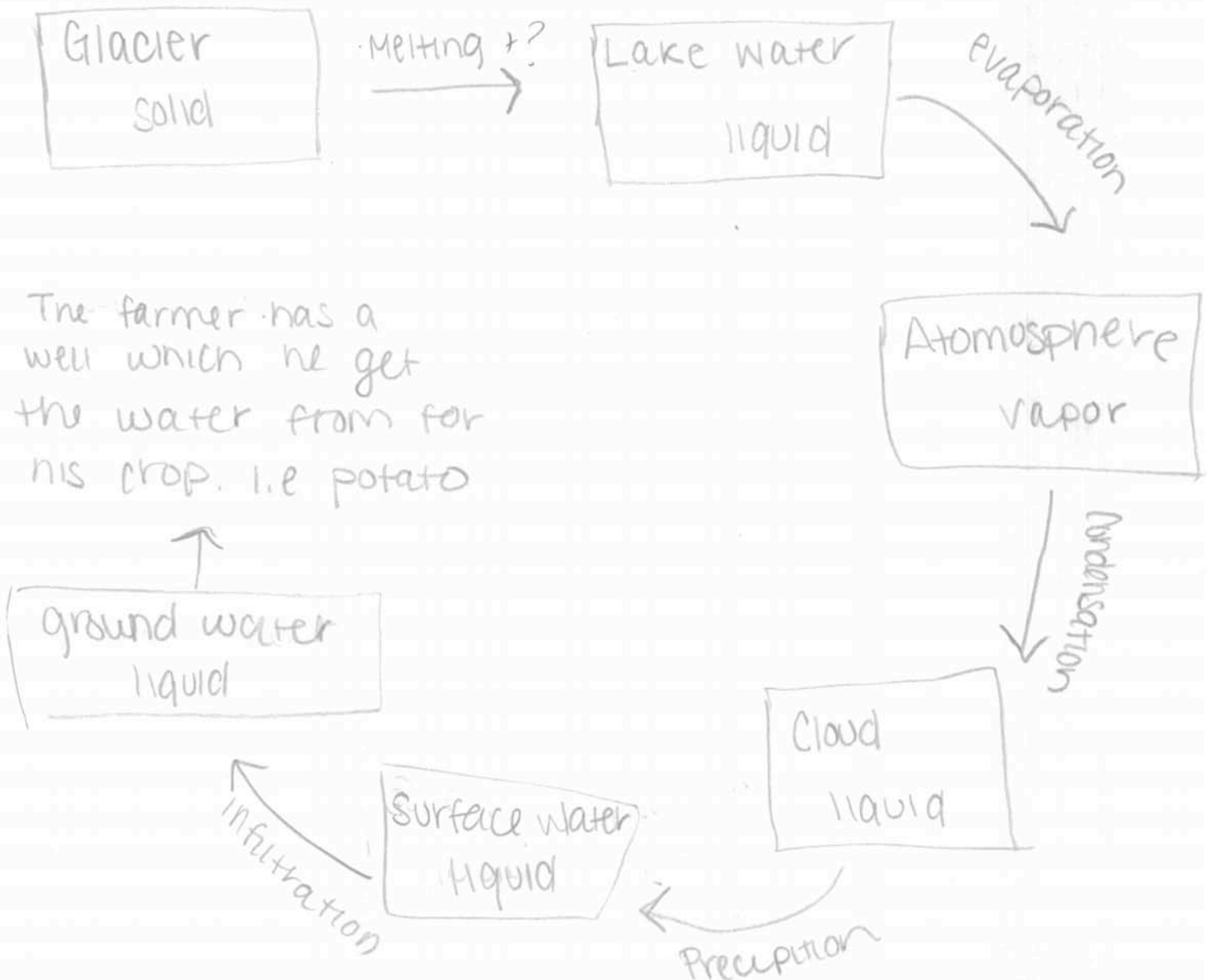
8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- ☒ a. been greater
  - b. been less
  - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
  - b. Plants convert energy into biomass
  - ☒ c. Plants release energy

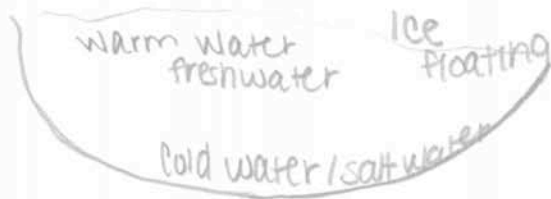
**SHORT ANSWER. 25 points each (50 points total)**

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
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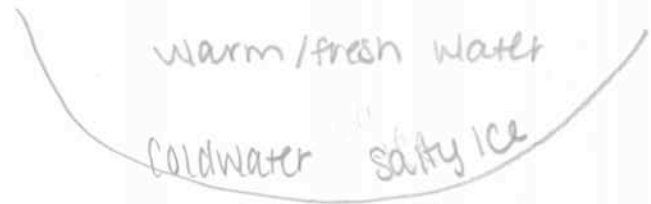
2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
  - The energy that is causing movement or transformation of water.

A. Salt water is more dense than fresh water so regular ice floats.



- If polar ice contained more salt than the surrounding sea level the ice would sink to the bottom of the sea

The sinking or floating of the ice has to do with its density & buoyancy.



B. The energy that is causing the movement & transformation of the water is gravitational, thermal, & chemical. All 3 types of energy

10

EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

45 35  
YOUR SCORE:  
80

STUDENT ID #: A40461394; GROUP #: K

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?

- Same*
- a. Water molecules become larger
  - b. Gaseous water becomes liquid water
  - c. Hydrogen and oxygen atoms combine to form liquid water
  - d. The temperature of water molecules decreases

2. Which of the following is the largest freshwater reservoir

- a. The atmosphere
- b. Oceans
- c. Glaciers
- d. Lakes and streams

3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?

- a. Rainfall and surface runoff into the lake
- b. Seasonal high water from the Mississippi River
- c. Ground water from beneath the surface

4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.

- a. A= evaporation, B= deposition, C= sublimation
- b. A = condensation, B= precipitation, C= evaporation
- c. A= sublimation, B= precipitation, C= evaporation
- d. A = precipitation, B= freezing, C= condensation



5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?

- a. Liquid water from the pot condenses
- b. Liquid water from the pot evaporates
- c. Water vapor from the pot condenses
- d. Water vapor from the pot evaporates

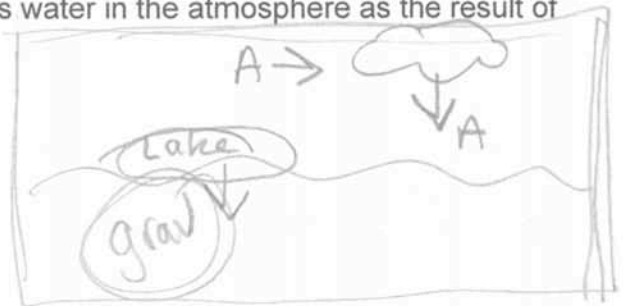
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?

- a. This is what one would predict with global warming
- b. This is the opposite of what one would predict with global warming
- c. Predictions about global warming do not address global precipitation.

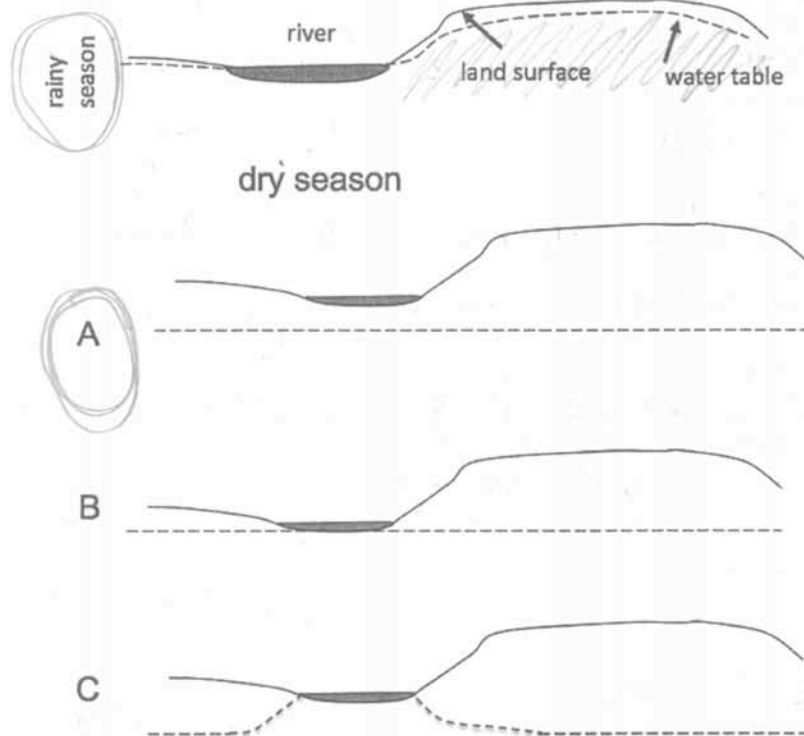
*warmer wetter*

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal  
 b. A = gravitational, B= gravitational, C= thermal  
 c. A = gravitational, B= thermal, C= thermal  
 d. A= thermal, B= thermal, C= thermal



8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:

- a. been greater  
 b. been less  
 c. remained the same

$$.9 > 1.0 < .9$$

10. What happens when plants respire?

- a. Plants convert biomass into energy  
 b. Plants convert energy into biomass  
 c. Plants release energy


SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

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- A name for each process that moves or transforms water

Water starts out in a glacier, I'll draw it like an ice cube for lack of skill ;)

PHASE




through sublimation the water in the ice "burns off" into the atmosphere. This was shown in the lectures through dry ice. Once in the atmosphere it moves to clouds. through evaporation, it is important to separate the process of water in the atmosphere and water in the clouds. It can have a residence time of 9 days in the atmosphere before falling back down to earth as precipitation. Because we are aiming for a potato I'll say it rained on a farm. here the water deposits into the soil and is then soaked up by the roots of the plants from where it sits in the ground water.

20



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

The circulation system is simple the salt water sinks and pushes up the fresh water making ~~the~~ a  circle if there was more salt water than the water would be heavier and the circulation would go faster causing warm water to surface faster, heating the oceans → making the living environment uncomfortable for the creatures in it. I think.

5

EXTRA CREDIT (2 points)

2 EC. How are burning wood and respiration similar?

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- They both convert thermal energy into gravitational energy
- ☒ They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

YOUR SCORE:

47



STUDENT ID #: A43330797; GROUP #: K

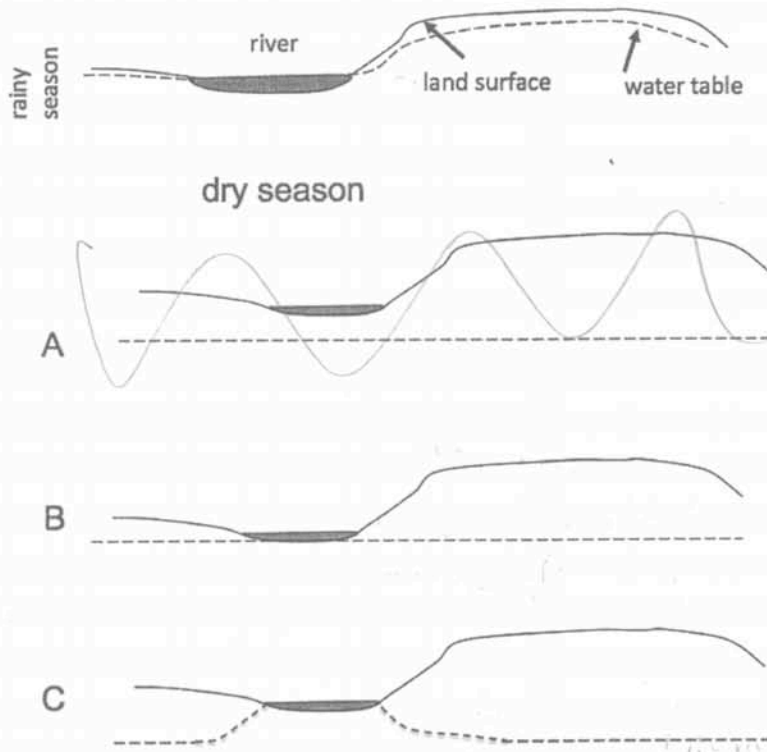
**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

- 8
1. What happens when water molecules condense?  
☐ a. Water molecules become larger  
☒ b. Gaseous water becomes liquid water  
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☐ d. The temperature of water molecules decreases
  2. Which of the following is the largest freshwater reservoir  
☐ a. The atmosphere  
☐ b. ~~Oceans~~  
☒ c. Glaciers  
☐ d. Lakes and streams
  3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?  
☐ a. Rainfall and surface runoff into the lake  
☐ b. Seasonal high water from the Mississippi River  
☒ c. Ground water from beneath the surface
  4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.  
☐ a. A= evaporation, B= deposition, C= sublimation  
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  5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?  
☐ a. Liquid water from the pot condenses  
☐ b. ~~Liquid water from the pot evaporates~~  
☒ c. Water vapor from the pot condenses  
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  6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?  
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7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal  
b. A = gravitational, B= gravitational, C= thermal  
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8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



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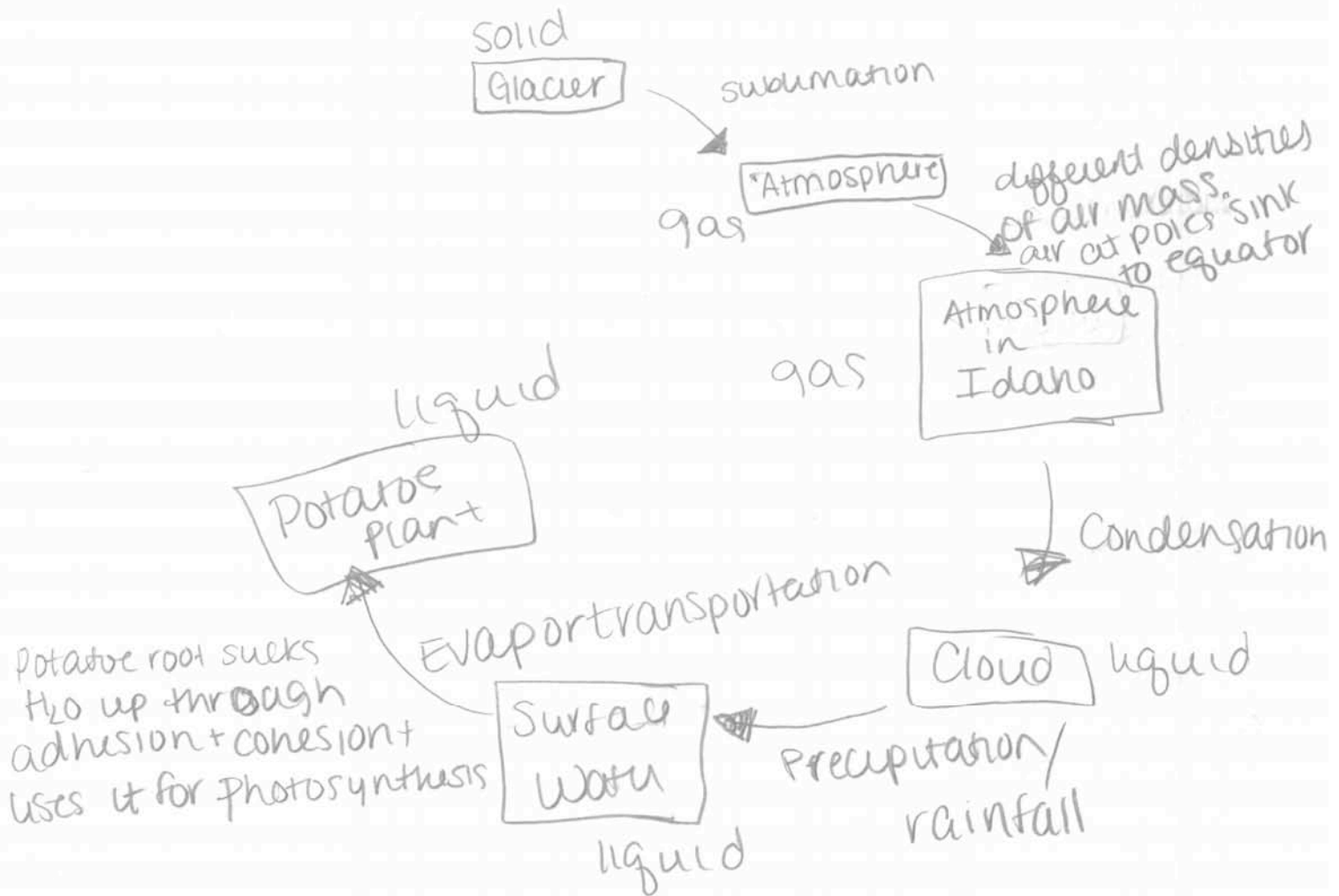
- a. been greater  
b. been less  
c. remained the same

Dense water

10. What happens when plants respire?  
a. Plants convert biomass into energy  
b. Plants convert energy into biomass  
c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

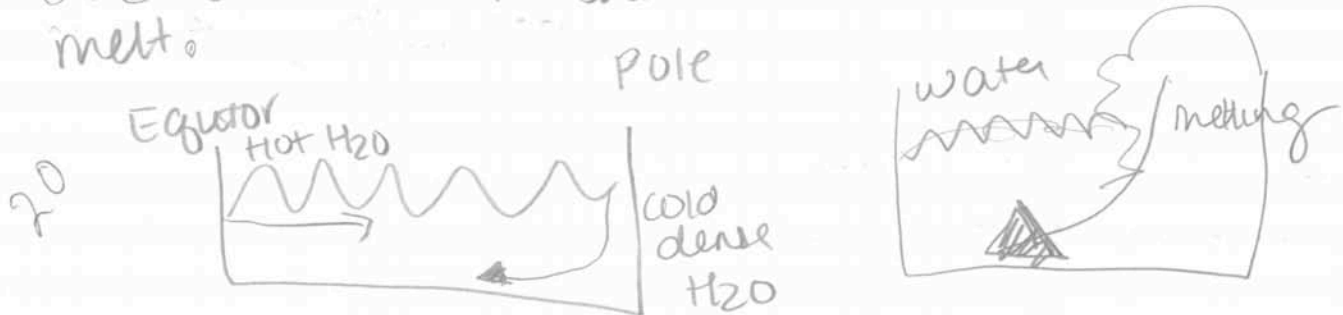
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  - A name for each process that moves or transforms water



25

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- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
  - The energy that is causing movement or transformation of water.

Circulation occurs because of <sup>the</sup>unequal <sup>solar</sup> heating of the earth caused by earth's spherical shape. Thus, the poles receive less heat than equator. ✓  
If polar ice had more salinity, it would sink. Since salt causes more density. For the ice to not sink it would have to be less dense than the water. When it melts, the water would sink & go to the equator, while the less salty water would stay on top. The movement of H<sub>2</sub>O is caused by gravitational energy since gravity causes the dense water to sink. Chemical energy causes glaciers to melt.



EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy

H<sub>2</sub>O + CO<sub>2</sub>

YOUR SCORE:

85

STUDENT ID #: A42627086; GROUP #: K

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

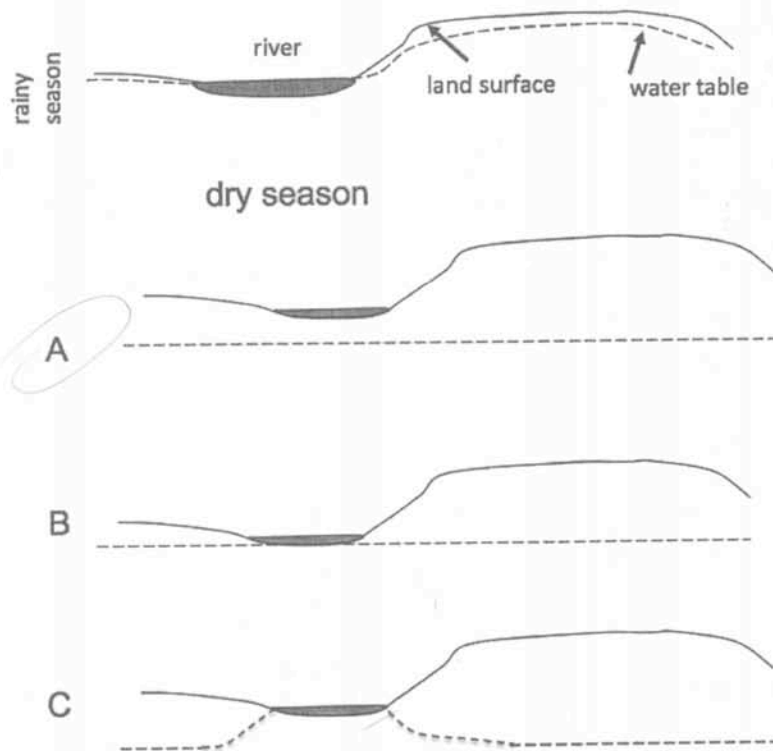
- 5
1. What happens when water molecules condense?  
a. Water molecules become larger  
b. Gaseous water becomes liquid water  
c. Hydrogen and oxygen atoms combine to form liquid water  
d. The temperature of water molecules decreases
  2. Which of the following is the largest freshwater reservoir  
a. The atmosphere  
b. Oceans  
c. Glaciers  
d. Lakes and streams
  3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?  
a. Rainfall and surface runoff into the lake  
b. Seasonal high water from the Mississippi River  
c. Ground water from beneath the surface
  4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of \_\_\_\_A\_\_\_\_, then becomes water in a glacier through the process of \_\_\_\_B\_\_\_\_, and then becomes water in clouds through the process of \_\_\_\_C\_\_\_\_.  
a. A= evaporation, B= deposition, C= sublimation  
b. A = condensation, B= precipitation, C= evaporation  
c. A= sublimation, B= precipitation, C= evaporation  
d. A = precipitation, B= freezing, C= condensation
  5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?  
a. Liquid water from the pot condenses  
b. Liquid water from the pot evaporates  
c. Water vapor from the pot condenses  
d. Water vapor from the pot evaporates
  6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?  
a. This is what one would predict with global warming  
b. This is the opposite of what one would predict with global warming  
c. Predictions about global warming do not address global precipitation.

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EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of \_\_\_\_\_ A \_\_\_\_\_ energy. Water in the atmosphere becomes water in clouds as a result of \_\_\_\_\_ B \_\_\_\_\_ energy. Water in clouds becomes water in the atmosphere as the result of \_\_\_\_\_ C \_\_\_\_\_ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- ☒ c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



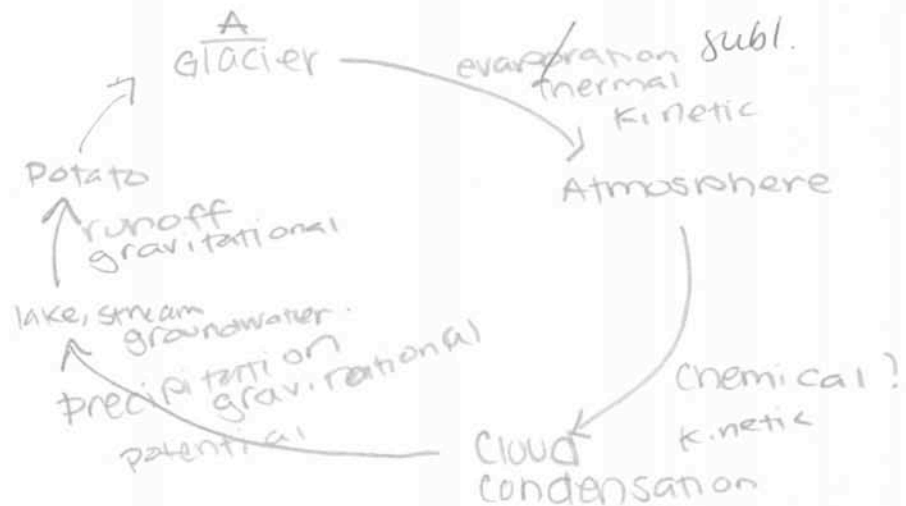
9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
  - ☒ b. been less
  - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
  - b. Plants convert energy into biomass
  - ☒ c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water

If the water <sup>molecules</sup> from the glacier is evaporating into the atmosphere & the condensation happens & forms a cloud & the cloud moves/travels through the atmosphere & eventually it rains/precipitation happens causing the water molecules to fall & become part of the potato or it could precipitate into a river or lake & runoff could occur & become part of the potato that way



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2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

If there was more salt in the polar ice than the surrounding seawater thermohaline circulation would change because. when circulation happens in the water cycle water evaporates into the atmosphere, condenses to form clouds the precipitates back into the atmosphere & back into the ground, lakes etc... & if more salt is being brought into the atmosphere through the water cycle it would effect everything. Circulation happens because things in the environment such as temperature, to happen causing water to evaporate (gravitational (thermal energy)).

No!  
salt does  
NOT evaporate

EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

YOUR SCORE:

47